THE IRON AGE

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 80: No. 10. *New York, Thursday, September 5, 1907*

$3.00 a Year, including Postage. Single Copies, 15 Cents.

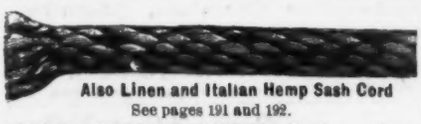
Reading Matter Contents .....page 652
Alphabetical Index to Advertisers " 304
Classified List of Advertisers " 294
Advertising and Subscription Rates" 688

Reed F. Blair & Co.
Frick Building, Pittsburg, Pa.
COKE, PIG IRON
CHROME ORE
FERRO MANGANESE
SILICON SPIEGEL, ETC.

The American Mfg. Co.
Ropes and Twines
65 Wall Street, New York

THE BRISTOL COMPANY
Waterbury, Conn., U. S. A.
New York: 114 Liberty St.
Chicago: 753 Monadnock Bldg.
Bristol's Recording Instruments
For Pressure, Temperature and Electricity.
Simple, Accurate, Reliable.
All Ranges, Low Prices, and Guaranteed. Send for Catalog R.

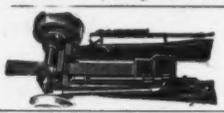
SAMSON SPOT CORD



Also Linen and Italian Hemp Sash Cord
See pages 191 and 192.
SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES

Cleveland City Forge and Iron Co., - Cleveland, O.



DROP HAMMER MERRILL BROS. BROOKLYN N. Y.

FOUNDRY IRON.
Pilling & Crane Girard Building, Phila. Macheaney Bldg., Pittsb'g Empire Bldg., New York.

Cover your roof with
M. F. ROOFING TIN
and you'll have to "look out" if you want to know how the weather is—the roof will never tell you.

See
AMERICAN SHEET & TIN PLATE COMPANY'S
Ad. on Page 18

SPORTSMEN'S HEADQUARTERS
U.M.C.
AMMUNITION
U.M.C. CARTRIDGES ARE GAME GETTERS
Remington AUTOLOADING RIFLES
BEAUTIFUL WINDOW TRIM FREE
Bring more sporting goods customers into your store by means of the beautiful U. M. C. — Remington window display shown herewith. Lithographed in six colors. Adjustable to any size window. It is the finest window advertising scheme ever put out. Sent with full instruction upon receipt of postal. Address
The Union Metallic Cartridge Company
Advertising Department
313 Broadway, New York City
Remington AUTOLOADING SHOTGUN
U.M.C. SHOT SHELLS

WATER TUBE BOILERS *The* Babcock & Wilcox Co. 85 Liberty Street New York
See page 65

There is More Profit for the Merchant in Carrying
"Capewell" Horse Nails
Than others because there is such a large demand for this brand. Considerably **more than half of** all the horseshoe nails sold in the United States are "Capewell." **It pays a dealer,** therefore, always to carry these nails in stock.
THEY SELL THE BEST
Made by
The Capewell Horse Nail Co., Hartford, Conn.

JENKINS BROS. VALVES
STANDARD PATTERN.
Made of new steam metal of the best grade. Fitted with the *Jenkins Disc*, assuring an absolutely steam tight valve under all ordinary pressures. When fitted with a *soft* Jenkins Disc they are the most satisfactory valves that can be obtained for use on water, air or gas. All parts interchangeable. Every valve bearing the Trade Mark is guaranteed.
JENKINS BROS., New York, Boston, Philadelphia, Chicago, London.

"Swedoh" Cold Rolled Steel is unexcelled for **Drawing** and **Stamping**
THE AMERICAN TUBE & STAMPING COMPANY
Water and Rail Delivery) BRIDGEPORT, CONN.
SEE PAGE 26

MAGNOLIA ANTI FRICTION METAL
The Standard Babbitt of the World
We manufacture everything in the Babbitt Line.
MAGNOLIA METAL CO.

New York: 115 Bank St. Chicago: Fisher Building. Montreal: 31 St. Nicholas St.

PROMPT SHIPMENTS

We are now in a position to make

QUICK DELIVERIES

of

BLACK SHEETS

in

ONE PASS COLD ROLLED

and special quantities and finishes.

FOLLANSBEE BROTHERS COMPANY

PITTSBURGH

BRASS { SHEET, ROD, WIRE

COPPER { SHEET, ROD, WIRE

GERMAN SILVER { SHEET, ROD, WIRE

LOW BRASS, SHEET BRONZE, SEAMLESS BRASS AND COPPER TUBING, BRAZED BRASS AND BRONZE TUBING

WATERBURY BRASS CO.,

WATERBURY, CONN.

99 John St., New York. Providence, R. I.

Bridgeport Deoxidized Bronze & Metal Co.

BRIDGEPORT, CONN.

Phosphor and Deoxidized Bronze

Composition, Yellow Brass and Aluminum Castings, large and small

---

The Plume & Atwood Mfg. Co.

Manufacturers of

Sheet and Roll Brass

and

WIRE

Printers' Brass, Jewelers' Metal, German Silver and Gilding Metal, Copper Rivets and Burrs

Pins, Brass Butt Hinges, Jack Chain, Kerosene Burners, Lamps, Lamp Trimmings, &c.

279 Broadway, NEW YORK

Room 508 Heyworth Building, East Madison St., CHICAGO, ILL.

Rolling Mill THOMASTON, CONN — Factories WATERBURY, CONN.

SCOVILL MFG. CO.

MANUFACTURERS OF

BRASS, GERMAN SILVER,

Sheets, Rolls, Wire Rods, Bolts and Tubes, Brass Shells, Cups, Hinges, Buttons, Lamp Goods.

Special Brass Goods to Order.

FACTORIES:

WATERBURY, CONN.

DEPOTS:

NEW YORK CHICAGO BOSTON

Henry Souther Engineering Co.

HARTFORD, CONN.

Consulting Chemists, Metallurgists and Analysts.

Complete Physical Testing Laboratory. Expert Testimony in Court and Patent Cases.

Matthiessen & Hegeler Zinc Co.,

LA SALLE, ILLINOIS.

SMELTERS OF SPELTER

AND MANUFACTURERS

SHEET ZINC AND SULPHURIC ACID.

Special Sizes of Zinc cut to order. Rolled Battery Plates
Selected Plates for Etchers' and Lithographers' use.
Selected Sheets for Paper and Card Makers' use.
Stove and Washboard Blanks.

ZINCS FOR LECLANCHE BATTERY.

Arthur T. Rutter & Co.

256 Broadway

NEW YORK

Small tubing in Brass, Copper, Steel, Aluminum, German Silver, &c. Sheet Brass, Copper and German Silver. Copper, Brass and German Silver Wire. Brazed and Seamless Brass and Copper Tube. Copper and Brass Rod.

BRASS FOUNDERS FINISHERS J. J. RYAN & CO.

105-109 So. Jefferson St., Chicago.

Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS On Short Notice

---

THE BRIDGEPORT BRASS CO.,

BRIDGEPORT, CONN.

Postal Telegraph Building, Broadway and Murray St., New York.
85-87 Pearl St., Boston.
17 N. 7th St., Philadelphia

MANUFACTURERS OF

Brass AND Copper { SHEET, TUBING, WIRE

Metal Goods made to order from Sheet, Rod, Wire and Tubing.

GERMAN SILVER | **NICKEL ANODES** Brass, Bronze, and Copper

THE SEYMOUR MFG. CO. - - SEYMOUR, CONN

HENDRICKS BROTHERS

PROPRIETORS OF THE

Belleville Copper Rolling Mills,

MANUFACTURERS OF

Braziers' Bolt and Sheathing

COPPER

COPPER WIRE AND RIVETS,

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.

49 CLIFF ST., NEW YORK.

PHOSPHOR-BRONZE
GERMAN SILVER

THE RIVERSIDE METAL CO.
RIVERSIDE, N. J.

THE IRON AGE

New York, Thursday, September 5, 1907.

Two New Stoever Pipe Machines.

At the recent master mechanics' convention in Atlantic City, the Stoever Foundry & Mfg. Company, Myerstown, Pa., exhibited the two machines illustrated herewith. That shown in Fig. 1 is a new 2-in. lever type pipe threading and cutting off machine, and that shown in Fig. 2 is a No. 2 automatic pipe bending machine, the latest type of its class built by this company.

The 2-in. Lever Type Pipe Threading Machine.

This machine has been designed with a consideration for the conditions as they exist in a pipe shop where widely varying sizes may have to be worked upon in indiscriminate order. It has been the aim to make the machine as rapid as possible in the handling of such work. It is capable of cutting off and threading pipe of all sizes between ¼ and 2 in. of either steel or iron. Through a sliding gear and a clutch nine different speeds, proportioned in accordance with the work, are obtainable from a constant speed driving pulley. The proper speeds for various sizes of pipe and how to obtain them are indicated by a plate on the headstock. All of the shafts and gears are on the outside of the machine proper, but the gearing is completely inclosed by a cover, which can be quickly removed to expose it for inspection.

For the sake of rigidity and stiffness of the bearings, the bed and headstock are in one piece, it being the contention of the builder that bearings in separate castings bolted to the bed cannot properly withstand the strain put upon the front bearing of the main spindle when the chuck is operated. The chuck is of an improved lever type, which may be gripped or released while the spindle is rotating. Though powerful in its action, only a little pressure on the hand lever at the side of the machine is necessary to operate it. All of the gripping parts being within and the exterior of the chuck smooth, the operator is in no danger of having his hands or clothing caught. The three universal gripping jaws may be adjusted from any one of three points 120 degrees apart around the circumference of the chuck, so that one is always convenient to the operator. All parts inside of the chuck are of steel.

For supporting the various sizes of pipe a set of bushings is provided, each of which when used extends clear through the spindle and has a bearing at each end. When the chuck is open the jaws are always outside of the bushing, which prevents the operator from jamming the pipe against the jaws. For making long or short nipples an improved holder is used consisting of three pieces of hardened tool steel. These are placed in the same chuck in which the gripping jaws are used, and are opened and closed by the same lever movement.

The supporting member for the die head slides longitudinally on the bed, and the head is free to move laterally to accommodate it to an eccentric pipe, relieving the dies of strain and insuring an even depth of thread all around the pipe. The head can be pushed to one side so as to pass the chuck, which allows the cutting off tools to be brought very close to the chuck for cutting off the shortest pieces of pipe. With the head slid out of the way, pipe can be inserted from the front, and, passing it through the stand, prevents it from dragging over the dies. The head is equipped with inserted interchangeable steel cams for taking the thrust of the dies and adjusting them. Hardened steel plates are also placed in the bottom of the die slots to resist the wear due to contracting and expanding the dies, thus keeping the lead of the separate chasers absolutely correct.

To facilitate changing chasers the front face of the head swings outward and the change can be made at any position of the cams. Opening the face also completely exposes the interior for cleaning. The machine can be equipped with one universal head for all sizes of pipe, or with a separate head for each size. The latter arrangement is advantageous in jobbing shops where

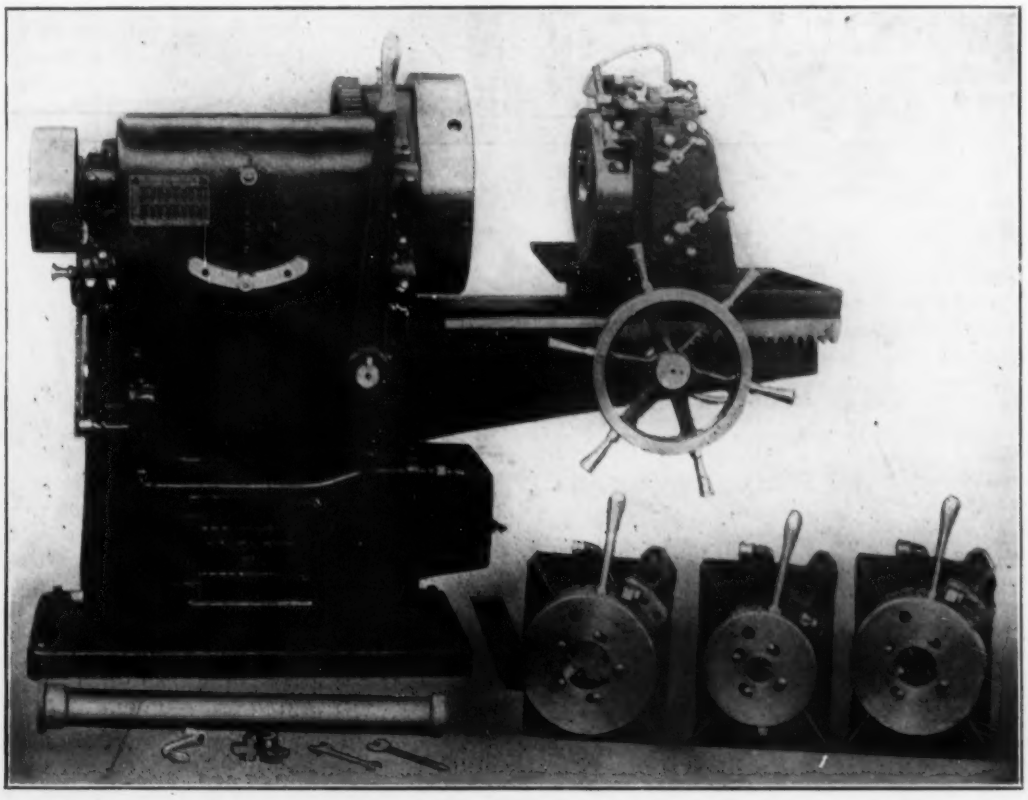


Fig. 1.—The New Pipe Threading and Cutting Off Machine Built by the Stoever Foundry & Mfg. Company, Myerstown, Pa.

changes from one size to another and perhaps back again are frequent, as it does away with die adjustments. The ways of the die stand are long enough to admit two heads, so that one being used on a fairly steady job may be pushed back and another for a short job may be put on, used, taken off and the first brought back to position to continue the original work.

Two cutting off tools are used, both operated by the same screw and handle. A universal adjustment is allowed for, so that both tools will always be cutting.

The oil supply to the dies and cutting off tools is delivered by a gear pump which works in either direction and is driven by chain from the constant speed driving pulley. After being used the oil drains into the bed and through strainers to the tank on the base, from which it is drawn by the pump. The cabinet base of the machine affords space for dies, nipple holders, wrenches, &c. A large oil pan is cast around the base. The net weight of the belt driven machine with one universal die head, dies, countershaft and bushings is 2500 lb.

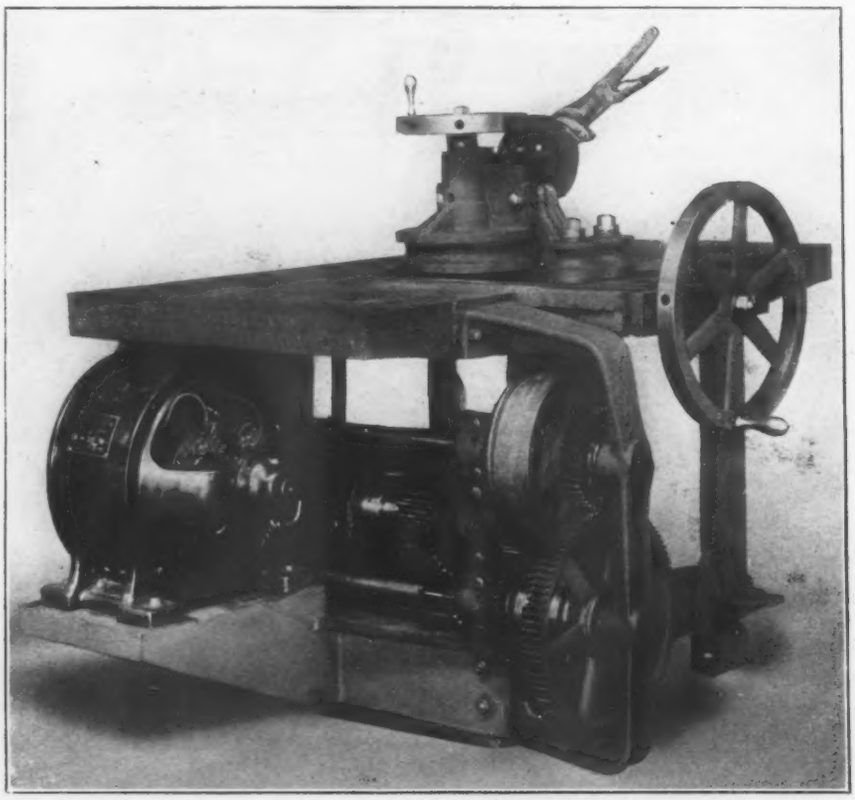


Fig. 2.—The Stoever No. 2 Automatic Pipe Bending Machine.

The No. 2 Automatic Pipe Bending Machine.

As might be understood from Fig. 2, the bending machine is a special manufacturers' machine and not in any sense a portable contractor's bender. The view shows a motor driven form, but where the machine is belt driven the only difference is the omission of the supporting bracket for the motor and the gears between it and the belt pulley shaft. When driven by belt only one speed is possible, but when a motor is attached it is preferable to use one of variable speed type, as different speeds may then be used for different bends. The machine is capable of bending 1, 1¼, 1½ and 2 in. pipe at radii varying from 2½ in. for 1-in. pipe to 12 in. for all four sizes.

The power is transmitted from the pulley shaft through three gear reductions to the vertical spindle holding the main forming roller. The latter is in two pieces, separable in its central plane; the lower half is keyed to the spindle and the upper half feathered upon it, so as to be vertically adjustable by the hand wheel at the top of the spindle. After a bend has been formed, particularly a 180-degree or return bend made cold, it is necessary to release it by raising the upper half of the roller. Removably fastened to the former, so that it may be used with others of different size, is a vise having two universal adjustable jaws operated by the lever shown. Interchangeable bushings are used in these jaws for various sizes of pipe.

The large hand wheel at the side actuates a slide in the table carrying two rollers to move them from or toward the central spindle, according to the size of forming roll it carries. One of the small rollers is in line with the large roller and forces the pipe into the latter; the other is a guide roller for keeping the unbent part of the pipe in position. When a bend has been formed and removed, a clutch is operated to throw in a set of gears, reversing the rotation of the spindle returning the forming roll to its original angular position. Arms adjustably located on the spindle, contact with adjustable stops on a rod connected with the clutch, to automatically stop rotation in either direction. It is thus possible to make any number of bends exactly alike. The clutch can also be thrown either way by the foot treadle shown in the illustration.

In using this machine is it not necessary to fill the pipe, as the normal section is retained throughout the bend without it. The number of bends that may be made in a given time depends on the degree and radius of curvature. It has made 16 complete bends in 10 minutes, and a number of times in daily operation has made 300 bends in 9 hr.; these were 180 degree bends of 2-in. pipe made to a radius of 4 ft. and having 5 or 6 ft. legs.

Chicago Subway Traffic.—The Illinois Tunnel Company announces that by November 1 the subway is expected to be carrying daily to and from railroad freight houses of the city 10,000 carloads of freight of 2 or 3 tons each. The tunnel railroads—18 east and west and 12 north and south—connect with the freight houses of the 23 railroads centering in the city. The subway company has lately made freight contracts with all of these roads. The tunnel lines have connections with a number of important stores. The tunnel motors already make 1000 trips a day with mails between the post office and railroad stations, and in the last three months have carried 2,516,430 pouches, of which 99.97 per cent. were delivered on time. The tunnel company has on its 2 ft. gauge tracks 1200 cars and 80 electric motors, and 50 more motors will soon be received.

Fluorspar Production in 1906.

WASHINGTON, D. C., September 3, 1907.—There was a heavy decline in the total production of fluorspar in 1906 as compared with 1905, according to the annual report of the United States Geological Survey, which has just been completed by E. F. Burchard. The total quantity of fluorspar marketed during the year was 40,796 net tons, valued at $244,025, compared with 57,385 tons, valued at $362,488 in 1905. The reduced output is doubtless due in large part to an overproduction in 1905, the surplus stock of which was sold the following year. The output of 1904 was only 36,452 tons, valued at $234,755. It is the custom of some producers to carry a reserve stock equal to about one year's production. There was, therefore, a large quantity on hand, unsold, at the close of 1906.

Illinois Leads the Industry.

The bulk of the production comes, as usual, from Illinois and Kentucky. The production reported from Illinois still retains the lead, and maintains a steadier condition than that from Kentucky. In the latter State there is great need of better shipping facilities from certain localities, in order to handle the present product and to develop the district properly. Arizona has reported no production since 1904, and the production reported from Colorado as far less than that of 1905, but Tennessee showed a substantial increase in 1906. Illinois in 1906 produced 28,268 net tons of fluorspar, valued at $160,623. Of this total 4529 tons were reported as ground spar, valued at $47,224, the remainder being sold as lump and gravel. There were 800 tons reported as mined, but not sold. The production of ground spar showed a decided increase in this State during 1906. Kentucky produced in 1906 nearly 12,000 net tons of fluorspar, valued at about $80,000. Of this total 4321 tons were reported as ground spar, valued at $43,318. About 1200 tons of spar were reported mined in Kentucky, but not sold. In Tennessee the produce was reported as all crude, 15 tons being unsold at the end of the year; in Colorado the product was likewise all lump and gravel.

Both in the early part of 1906 and at the close of the year the tendency of demand and prices was reported to be steadily upward, but the average values reported show a slight decrease below those of 1905. Kentucky crude fluorspar ranged from $3.60 to $5, with an average value of $4.22 per net ton. In the same State the ground material sold for slightly above $10 per ton. In Illinois the crude spar brought from $4 to $5.32, averaging $4.70, per net ton; and the refined ranged from $9 to $12, averaging $10.83, per ton. Colorado and Tennessee crude brought, respectively, $6 and $5 per ton. These prices are for the spar packed in sacks and barrels, f.o.b. at the shipping points nearest to the mines.

Preparation and Uses.

The various uses of fluorspar depend on its chemical composition, fluxing properties, and phosphorescence when heated, and on its optical and gemlike properties. Its preparation involves separation from other minerals with which it is associated, the treatment comprising hand sorting, crushing and jigging. Part of the high grade ore is ground and shipped in barrels and sacks; the rest is sold in lump form. Where fluorspar is associated with zinc blende, complete separation of the two minerals has been difficult on account of their nearness in specific gravity. While fluorspar is useful in smelting iron ores it is harmful to zinc, and therefore the zinc-fluorspar concentrates have been of little value. Recently a new process for separating fluorspar and zinc has been reported as successful, which promises to increase the production of both minerals.

The three principal classes of consumers of fluorspar are, in order of importance, smelters and metallurgists, makers of opalescent glass and enameled wares and chemical manufacturers. The highest grade, "American lump No. 1," which runs less than 1 per cent. silica and is white or clear pale blue in color, is sold either ground or in lumps, for use in the glass, enameling and chemical industries, the latter including the manufacture of hydrofluoric acid. Grinding of the pure, clear spar can be dispensed with for some purposes, as it readily decrepitates to a powder when heated. The second grade, "American lump No. 2," is used by blast furnaces in the production of ferrosilicon and ferromanganese, and in basic open hearth steel furnaces to give increased fluidity to the slag and to reduce the contents of phosphorus and sulphur. This grade includes colored spar and may run as high as 4 per cent. silica, though mostly sold with a 3 per cent. guaranty. The lowest grade, "gravel spar," including all that containing more than 4 per cent. silica, as well as spar mixed with calcite, is used in iron and brass foundries, where it is of value in making the metal more fluid, in permitting the use of greater quantities of lower grades and scrap, and because it carries phosphorus, sulphur and other impurities into the slag.

Character and Occurrence.

Fluorspar, associated with other minerals, has a broad distribution geographically, and a wide range geologically. The deposits thus far exploited are, however, confined to five States: Arizona, Colorado, Illinois, Kentucky, and Tennessee.

The Arizona production has come mainly from the Castle Dome District, Yuma County. In 1902, 1903, and 1904 small quantities of fluorspar were shipped from this locality, but during the last two years there has been no production reported beyond that required for assessment work. In Colorado the fluorspar occurs in Boulder and Custer counties, along the Front Range. The chief deposits in Illinois and Kentucky occur in adjoining portions of the two States, Hardin and Pope counties in Illinois, being separated from the Kentucky counties, Crittenden, Livingston, and Caldwell, only by the Ohio River. The great size and the purity of the fluorspar deposits of the Illinois-Kentucky District indicate that for many years they will continue the main source of domestic production. Prospecting with favorable results has been reported from Mercer County, in central Kentucky. The Tennessee production has been from Smith and Trousdale counties, near the central part of the State. A most recent addition to the list of possible producing States is California, since fluorspar deposits in San Bernardino County are now being investigated. Flourspar is secured as a by-product of lead and zinc in Albemarle County, Va.; with gold tellurides at the Cripple Creek mines, Colorado, and at a number of other localities in quantities too small for use at present. Practically, wherever it has been mined, fluorspar occurs as a veinstone, although under widely different conditions. In the Kentucky-Illinois District it is the chief mineral or ore of value in many of the veins, lead and zinc being of secondary importance, and in many places not valuable even as by-products, while in the Castle Dome District, jig concentrates of fluorspar are made incidental to concentrating the lead-silver ores.

Imports.

There is considerable fluorspar imported at present, but the market is practically limited to the Atlantic Coast, since the cost of freight from English seaports to points west of New York tends to restrict the field. English fluorspar has heretofore been cheap, at times selling at a price below the present cost of American production, the shipments having been made from refuse dumps of abandoned lead mines, besides being brought to America as ballast, duty free. It is expected that the local and the American demand will consume these English fluorspar mill tailings within a few years, and that thenceforth the material cannot be profitably exported to America, as the mines are closed. The quantity of flourspar imported into the United States in 1906 was not reported as such, but was grouped with other imports by the Bureau of Statistics. Good grades of imported fluorspar for chemical use have been recently sold at New York for $7.70 per ton, ex vessel. W. L. C.

Liquid chalk is very handy when laying out work on castings or sheet iron or steel. The best solution is two-thirds pint of very finely powdered chalk, one-third hot water and two tablespoonsfuls of liquid glue, thoroughly mixed while hot. This can be applied with a brush, will not rub off with ordinary handling and provides a good surface on which to work.

A New Doty Scrap Shear.

An alligator type of shear especially intended for cutting up scrap, recently brought out by the New Doty Mfg. Company, Janesville, Wis., is shown in the accompanying illustrations. Two sizes are built; the smaller has a 14-in. knife and the larger a 24-in. knife. Both will cut scrap up to ½ in. thick, and are very strong and powerful. Fig. 1 shows the general appearance of a machine of this type and Fig. 2 side and end elevations. From the latter it will be seen that no gears enter into the construction; the power is directly applied to the eccentric shaft, which is intended to run at about 80 strokes per minute. A motor can be attached directly to the driving shaft if desired, or belt drive may be employed.

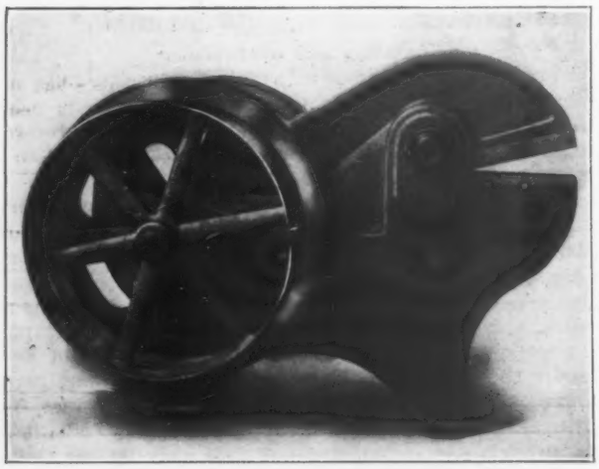


Fig. 1.—A New Scrap Cutting Shear Made by the New Doty Mfg. Company, Janesville, Wis.

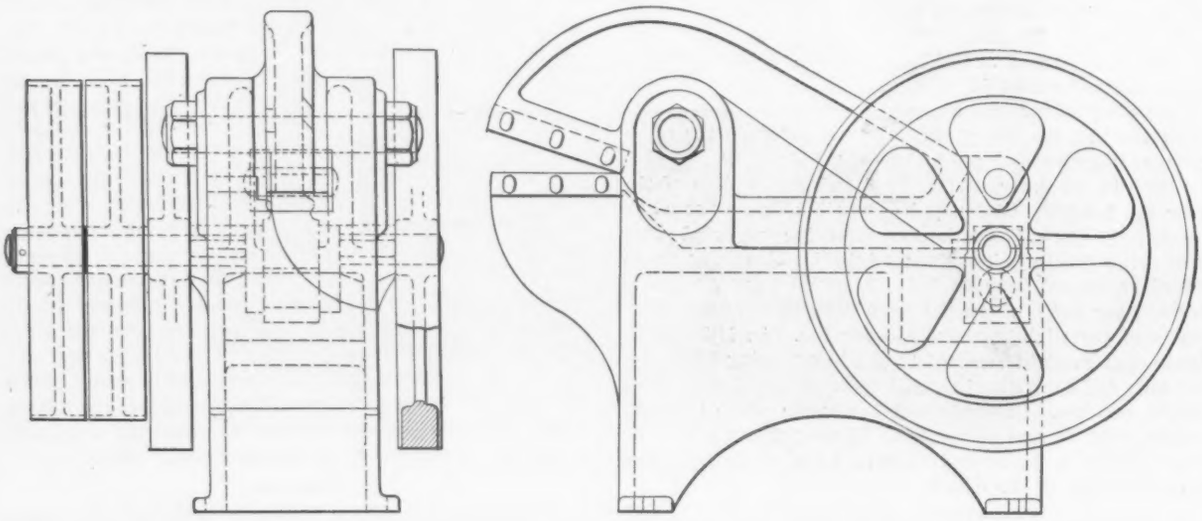


Fig. 2.—End and Side Elevations of the New Doty Scrap Shear.

The Alcohol Engine.—Referring to the fact that the practical alcohol motor is as undeveloped, from all indications, as before the denatured alcohol legislation was enacted, *Power* says: "The point has been made by several writers that starting an alcohol engine involves difficulties because the alcohol must be heated before it will volatilize with sufficient rapidity for use as fuel. This, of course, is a practical obstacle, but it must be overcome sooner or later and does not constitute a sound reason for neglecting the development of that type of engine. Moreover, it is an obstacle that should be overcome in several ways by the exercise of ordinary ingenuity."

In the handicap race across the Atlantic between the Lucania and the Lusitania, the former will leave Liverpool at 4.30 p.m., September 7, and the latter at 7 o'clock p.m. Both will stop at Queenstown for mail and passengers. The distance from Queenstown to Sandy Hook is about 2750 nautical miles. The Lucania now holds the record from Queenstown, having made the trip in 5 days 7 hr. and 23 min. It is figured that if the Lusitania shows on this trip speed equal to that made on her trial trip—namely, 25.5 knots, she will win the coming race by about 10 hr.

Government Railroad Ownership in Mexico.

Consul W. D. Shaughnessy of Aguascalientes advises the Department of Commerce and Labor that a great deal of uneasiness is felt among the mining and smelting interests owing to the recent advance in railroad freight rates by the Mexican Government, which went into effect August 9. Concerning this he says:

"It is a complete revision of the general freight tariff and the classification, advancing the rates on practically all commodities, but is especially pronounced on the shipments of ores. The increase in the latter case will average 20 per cent. The new classification will affect all of the Mexican Government's main and branch railroad lines, and it is rumored that when the merger of all the railroads in the republic actually takes place, which is antisipated in the near future, the rates will again be increased, making the total advance enormous.

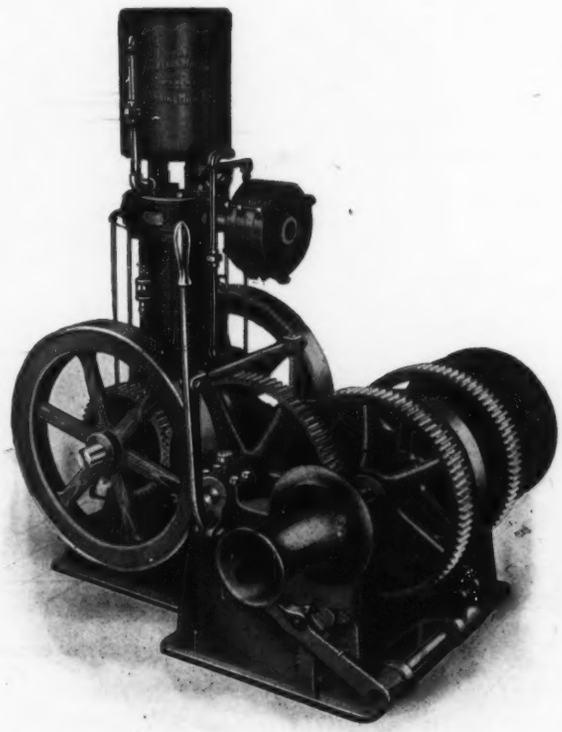
"The many mining interests in Mexico, of which a large percentage are American operators and stockholders, will suffer to a great extent. Those who have heretofore managed to ship the low grade ores upon a paying basis will be unable, under the new classification, to transport any except the high grade ores. This will result sooner or later in the necessity of shutting down a great number of the low grade mines.

Motor scooting is a new sport which is to motor boating what ice yachting is to sailing. The first scooter, according to the *Automobile*, is a 14-footer, with sharp prow and rounded stern, fitted with a very light four-cylinder air cooled gasoline engine of about 20 hp., mounted in the forward end of the cockpit on heavy rubber cushions, to reduce jar. The shaft drives an ordinary bicycle wheel with reinforced steel rim, containing steel studs about ½ in. long. This wheel runs in a centerboard case and can be made to bite firmly into the ice, touch it lightly or revolve freely. An automobile steering wheel operates a long, fin shaped rudder under the stern, which when running straight does not touch the ice, but when steering is brought in contact to port or starboard. No danger attends running into water, for the centerboard case keeps water out of the hull. Not only is this craft fast on ice, but it does almost equally well on hard, frozen snow. On the Great South Bay a speed of 60 miles an hour has been attained; with higher gearing it is estimated that a speed of 100 miles an hour could be made.

The Peerless Gasoline Hoist.

A gasoline engine driven hoist intended particularly for the use of contractors is made by the Peerless Motor Company, Lansing, Mich., and herewith illustrated. The outfit consists of a 5-hp. vertical four-cycle engine and a double drum geared hoist capable of lifting 1000 lb. at 150 ft. per minute or 2000 lb. at 78 ft. per minute. The engine and hoist are mounted upon one base, making a neat, compact and rigid unit. The engine is fitted with a hit-or-miss type of governor and make-and-break igniter, and has a cast iron reservoir fastened to the top of the engine for circulating cooling water through the cylinder jacket by convection.

The hoist is constructed with gears and clutches of the company's own manufacture. The gears are cut from solid metal and are of four pitch, with 2¼-in. face. The clutches are designed to withstand the rough use and exposure to weather to which this kind of machinery is subjected. One of the clutch pinions transmits power directly to a large gear on the drum shaft, while the other clutch gear transmits its motion through an idler



A 5-hp. Gasoline Engine Driven Contractors' Hoist Built by the Peerless Motor Company, Lansing, Mich.

gear, giving the reverse rotation. The arrangement of clutches allows the engine to run continuously and always in the same direction.

In the middle of the drum shaft is keyed a brake wheel, capable of securely holding the maximum load in any position. The large drum is secured to one end of the drum shaft and is intended to take two or three wraps in the middle of a ⅝-in. cable, the free ends of which are fastened to two hoist cages, one ascending while the other is descending, so that the power expended is nearly all utilized in the actual raising of material. The smaller drum is secured to the opposite end of the drum shaft and is intended to be used for handling timbers, stone, I-beams, &c.

The gears on the hoist, although not so illustrated, are covered with steel hoods to protect them and remove their menace to the operator. The brake is controlled by a foot lever, and is equally effective with the hoist running in either direction. The brake lever is locked in position by a ratchet segment and pawl that is controlled by the toe. The total weight of the equipment is 2600 lb. Wickes Brothers, with offices in Pittsburgh, New York, Philadelphia, Boston, and Saginaw, Mich., are distributing agents for this hoist.

The Cement Industry in 1906.

The production of cement in 1906 amounted to the enormous total of 51,000,445 barrels, valued at $55,302,277, exceeding by 10,897,137 barrels in quantity and $19,370,744 in value the production of 1905, which had been the banner year. Classified according to character, the production was as follows:

	Barrels.	Value.
Portland cement	46,463,422	$52,466,186
Natural cement	4,055,797	2,423,170
Puzzolan cement	481,224	412,921

These figures, compiled by L. L. Kimball are reported by the United States Geological Survey in an advance chapter from "Mineral Resources of the United States, Calendar Year 1906," and are somewhat greater than those given in the preliminary statistics of production issued by the survey early in the year, the difference being due to the fact that some of the returns were received too late for use in the first statement.

The most prosperous branch of the industry is, of course, the Portland cement branch, whose growth has been of the most phenomenal character. Twenty years ago, when the Portland cement output of the entire United States stood at about 250,000 barrels against nearly 7,000,000 barrels of natural cement, the first attempt was made to introduce the rotary kiln for the manufacture of Portland, the company exploiting the new process proudly claiming the ability to produce 30,000 barrels of cement per annum, and to triple this quantity as soon as the necessary grinding machinery should be added. To-day it is not considered in the least sensational if a company announces the capacity of its plant at 3000 to 5000 barrels a day, while the yearly production of the large plants runs well into the millions of barrels.

The decline of the natural cement industry has been gradual, but as steady as the increase of the Portland branch. In 1906 the effect of this decline has seemed to be even more widespread than in the preceding year. The owners of many plants have allowed them to remain idle, some have turned their attention to lime burning and kindred employments, and a few have dismantled the old plants and established buildings and machinery for making Portland cement. Since some of the limestone, known as cement rock, from which the natural cement is made forms an equally good base for Portland cement, the last course would seem to be both logical and wise.

The growth of the slag or puzzolan branch of the cement industry is interesting because of its steadiness. The advantage of the industry is that it consumes a product of iron furnaces which has for years been troublesome to dispose of and has been regarded as waste. This variety of cement is not burned in rotary kilns and should not be confused with Portland cement made with slag as a basis and burned in rotaries.

Although the prices at which cement was sold in 1906 were higher than those which prevailed in 1905, they were not inflated but resulted from a normal growth in demand. That the quantity of cement exported by the United States to foreign countries is not so large as it should be is probably due to the great home demand, but with continued increase in production the foreign trade cannot be long neglected.

English experiments with magneto and accumulator and coil ignition systems for gasoline engines seem to show that the engine power does not vary much, whatever the voltage may be. A 40-hp. six-cylinder engine was tested. With an accumulator and coil and a pressure of 4.2 volts the horsepower was 40.9; with pressures ranging from 6 to 10 volts the horsepower was 42. The only thing that seemed to alter was the degree the spark could be advanced—*i. e.*, the same power was obtained with a smaller advance when a higher voltage was used.

A New Milling Machine Dividing Head.

The Becker-Brainard Universal Index and Spiral Head,

In designing the new universal index and spiral head for its milling machines, which is illustrated herewith, the Becker-Brainard Milling Machine Company, Hyde Park, Mass., was governed by two purposes. In general a head was wanted that would answer for the wide range of work occurring in ordinary practice, and retain the desirable features of older heads but be supplemented with such features as experience had indicated would add to its usefulness on all work. The more direct motive was a desire to supply a spiral head equal to the heavier service now expected of a milling machine, but at the same time as accurate as such a tool should be. The features that are directly a consequence of this latter aim are stronger and more rigid construction and the use of a larger worm and worm wheel of coarser pitch.

The head is especially interesting because of the arrangement by which differential indexing may be accomplished regardless of the position of the head on the machine platen, and on other than plain cylindrical work alone, such as bevel gears, and on work with helical grooves, such as spiral gears, and also because of the arrangement by which the spindle and work may be rotated independently of the lead screw when the change

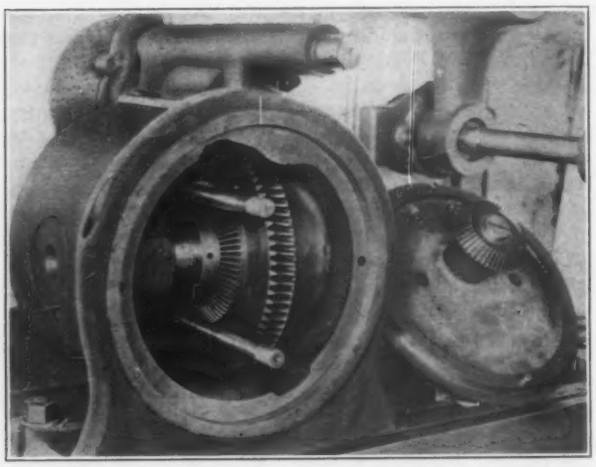


Fig. 1.—The New Becker-Brainard Universal Index and Spiral Head with Back Plate Removed.

gears are set for spiral milling, greatly facilitating the setting of the work. An adjustable clutch is the factor making this latter operation possible. Other points of novelty are the index crank, which may be rotated separately from the index pin, giving a crank of the same throw, regardless of the position of the index pin and eliminating the chance of the pin dropping on the plate while revolving the crank; the single reversible index plate for all divisions; the adjustable dial on the spindle nose for obtaining angular divisions in degrees for work requiring no great accuracy, and the means for taking up wear in the worm gear or dividing wheel. The worm gear is made in two sections divided in the central plane of the gear, so that one section may be rotated on the other to compensate for the wear on the teeth. This scheme is an old one for making very accurate worm gears by the hobbing process and affords the most accurate means of adjusting wear.

The stiffness of the construction is shown plainly in the various views. This increase in strength has not been had at the expense of ease of handling nor has it rendered the head clumsy or awkward to operate. The design is of an improved type, in which the swivel block is supported between heavy uprights, so as to swing in a vertical plane. By means of clamping bolts, which draw the outside plates tightly against the uprights, the block is held securely in any position during the heaviest cuts.

The principal feature is the large worm wheel used. For each size head it is as large as the respective swing would allow, and is much larger than that of any other form of head now in use. Fig. 1, a view of the head with the back plate removed, shows clearly the unusual size of the dividing wheel. Its large diameter adds much to the life of the wheel and insures greater accuracy in the work, and the resulting coarse pitch allows the taking of much heavier spiral cuts without the risk of impairing the accuracy or of distorting the teeth in the gear. The increase in stiffness of the head in general makes possible the use of much heavier cuts at faster feeds and speeds, thereby realizing the benefit of high speed steels.

The plan of making the differential indexing mechanism a component part of the head, has been carried out so that the head may be used as an index or dividing head in any position along the platen, with the spindle either parallel with, or at right angles to the main spindle

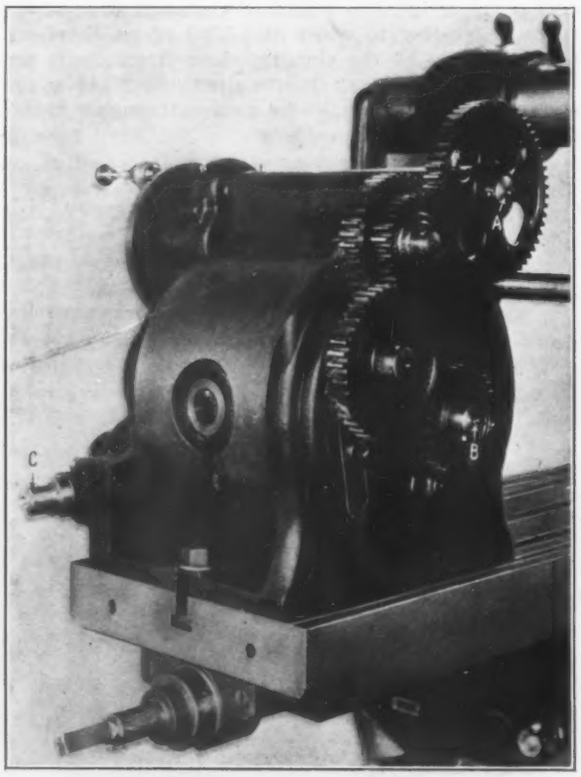


Fig. 2.—The Head with the Change Gears Used for Differential Indexing.

of the machine, or in any intermediate position. This has been accomplished by placing the change gears used in differential indexing on the rear side of the head, as shown in Fig, 2, where A marks the differential worm stud, B the differential spindle stud and C the spiral worm stud. The gears have no connection with the table, as is the case with the ordinary index head fitted for differential indexing. By virtue of the arrangement of the differential indexing gears it is possible to swing the spindle into position for cutting bevel gears or teeth on any conical work. This extends the range of differential indexing from cylindrical work to that which requires the angular setting of the spindle in the vertical plane.

To be universal the application of the differential indexing must be made available when cutting helical or spiral grooves, as on spiral gears. This has been done as follows: The principle on which the differential system of indexing works, makes it necessary to have the spindle and index plate so connected by change gearing, that the movement of the spindle will cause a movement of the index plate in one direction or the other. This requires that the index plate be free to move on its axis independently of the index crank during the indexing operation. In cutting spirals, the plate is geared to the lead screw by suitable change gears, as shown in Fig. 3. The connection between the lead screw D and the index plate must be broken when making a division, so that the index plate may be free to make the differential movement

with the index crank. This is accomplished by withdrawing the adustable clutch E during the indexing operation. After the division has been made, the teeth in the clutch will have changed relation, so that they cannot be engaged until one-half of the clutch, which is made adjust-

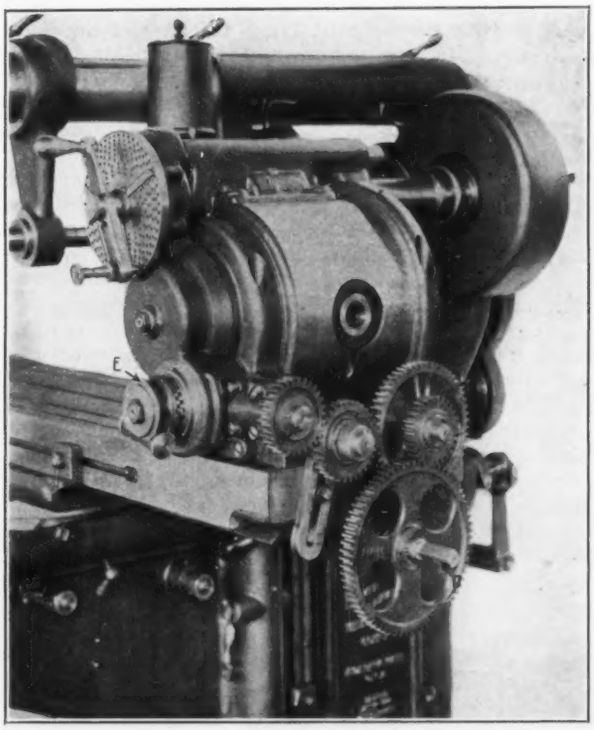


Fig. 3.—The Head Arranged and Equipped for Cutting Spirals.

able for that purpose, is rotated the required amount by means of the knurled knobs attached to it.

The connection between the index crank through the worm, worm gear, spindle and change gears of the differential indexing mechanism and the index plate, when the index pin is in mesh with a hole in the plate, forms a locked train, which must be released during the spiral cutting operation. The differential release is effected by means of the knurled knob F, Fig. 4, back of the index plate, which operates a friction clutch.

Frequently it is desired to roll the work on its axis a

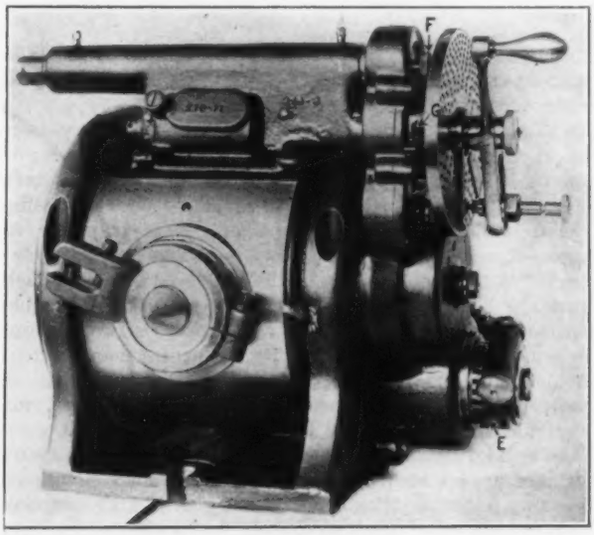


Fig. 4.—Another View of the Head, Showing the Differential Release and Means for Clamping the Plate.

small amount without shifting the dog or losing the position of the index pin, or the amount of roll over may be such that if the crank is used the pin would not come exactly over a hole. Should it be attempted to move both plate and crank in conjunction it would be found that the back pin of the ordinary head would not engage with a back hole. In this head the back pin is done away with and the plate is held in position, when resorting to plain indexing, by a frictional hold on the hub of the plate gear, which is clamped or released by the screw G, Fig. 4. By using this screw, work may be set regardless of the position of the plate, and the plate can then be clamped in the position it takes when the work is so set. The advantage of doing away with the back pin and substituting a more flexible holding device is apparent.

In work requiring the head to be connected up for spiral cutting, the roll over of work is made more convenient by the presence of the adjustable clutch E, which, as explained above, allows the disconnection of the spiral cutting train so that the spindle and work may be revolved or rolled over without changing the position in relation to the cutter in a direction parallel with the feed motion.

Pneumatic Tools in England.

At the summer meeting of the Institution of Mechanical Engineers at Aberdeen, Scotland, Herbert Bing read a paper on "Portable Pneumatic Tools." He said that considerable progress has been made in recent years, not only in the tools themselves, but in the range of work to which they are applicable. The engineers of Great Britain and the Continent are now as fully alive to the very important advantages to be derived from the use of pneumatic tools as the American engineers, who were the first to use such tools on an extensive scale. At present pneumatic tools are to be found in practically all engineering works, shipyards and mines throughout the world, and are largely used by contractors on constructional work. Many engineering firms in Great Britain are engaged in their manufacture, and the tools produced compare very favorably with those manufactured in the United States. While there is still room for improvement, both in design and construction, the results so far achieved have only been made possible by the employment of the greatest care in methods of manufacture.

In connection with pneumatic hammers, ordinary work is now done at a price for labor equivalent to a reduction of from 35 to 60 per cent. from hand labor rates. Riveting hammers are capable of driving rivets up to 1½-in. in diameter, and the rivets so driven in many marine boiler shops satisfactorily pass the tests imposed by the Board of Trade and Lloyd's surveyors. Locomotive builders are making increased use of pneumatic hand riveting hammers in their boiler shops, and the work stands the high steam pressures at present employed quite well. The pneumatic holder-on used with riveting hammers has been improved, and the type most favored now has a double piston. This has led to so marked an improvement that a hammer type holder-on is being introduced, the piston of which is really a valveless pneumatic hammer.

The great extension in the use of pneumatic drills the author considers to be strikingly significant of their general utility, and the rates paid for pneumatic drilling vary from 40 to 75 per cent. below those paid for hand drilling, the actual saving depending upon the nature of the work. In many shipyards, including the Government dockyards, all rivet holes are now reamed out by pneumatic drills. All sizes of boiler tubes are now expanded by pneumatic drills, which are also used by salvage companies. Recent improvements in drills have for their object providing a machine the mechanism of which can be readily adjusted and repaired at any shop without special tools or equipment, and a new feature in one instance is an arrangement of gearing which admits of the drill being run at two speeds.

For the first half of August the decrease in stocks of pig iron held in Connal's stores in the Cleveland District, England, was about 15,000 tons, the amount on hand August 15 being 205,608 tons, all but about 10,000 tons being No. 3 Cleveland iron. In the fall of 1906, when the American demand for Cleveland iron set in, the stocks in Connal's stores amounted to 598,000 tons.

Loads on Steel and Cast Iron Wheels.

The following data concerning the effect on steel rails of having cars equipped with solid steel and cast iron wheels respectively, were contributed by George L. Fowler in a topical discussion at the Atlantic City convention of the Master Car Builders' Association:

In 1887 the American Railway Master Mechanics' Association had a discussion in regard to the proper weight to put on wheels, and it was decided that about 12,000 lb. ought to be the limit. Now we are putting on 28,000 lb. In some cases 30,000 lb. is not an extreme case for a high capacity car. By loading cast-iron and steel wheels on the rail from 500 lb. to 150,000 lb. I found that at 20,000 lb., with the ordinary steel rail of 0.55 per cent. carbon, there was a spot left in the rail, that is, a depression you could see. That was checked off not only by the wheel and rail in ordinary conditions, but by a wheel and rail that had been polished to smoothness, and the same thing occurred at about the same figures, between 19,000 and 20,000 lb. On the other hand, at 150,000 lb., I could find no effect on the wheel, either cast-iron or steel. I started out to smash the cast iron wheel and failed. I could not do it by simply loading it vertically on the rail. I have diagrams which show that after the weight has gotten up to about 37,000 lb. it begins to break down the rail very rapidly under the cast iron wheel; in other words, that the whole of the compression or depression is in the rail as between the two metals, and the cast iron wheel does not partake of this at all, so that the rail has to take the whole strain, and that this excessive load put on the rail breaks down the metal and causes it to give way and the size of the spot to grow. It grows very much more with cast iron than it does with steel wheels, simply because the cast iron wheel does not take up part of that compression itself.

In the very valuable experiments of Professor Goss, two years ago, he gave the strength of the flange of a cast iron wheel as ranging from 40,000 to about 90,000 lb., with an average of 70,000 lb., though in my own work I did not obtain one wheel that broke at 116,000 lb. That is to say, that is the pressure that was required to break the flange directly back off from the wheel. On a solid steel wheel the pressure required was 556,000 lb., so that so far as the strength and wearing qualities are concerned they stand fully on a par with the steel tire.

The American Multigraph Sales Company, Cleveland, Ohio, the selling organization of the American Multigraph Company, maker of the Gammeter multigraph, held its first annual convention of branch managers and district sales superintendents at the Colonial Hotel, Cleveland, in the week of August 19. Subjects pertaining to all branches of the business were brought up for discussion. The branch managers reported that the outlook for business was never brighter.

The Improved Lo-Swing Lathe.

Since the Lo-Swing lathe, built by the Fitchburg Machine Works, Fitchburg, Mass., was described in its original commercial form in *The Iron Age* of November 2, 1905, a number of important improvements have been made on it by the designer, James Hartness of the Jones & Lamson Machine Company, Springfield, Vt. These changes have come about in the natural evolution of this relatively new type of machine tool and in its improved form, as illustrated in Fig. 1 herewith, quite an appreciable advance has been made. The characteristic features as before are low swing, simplicity of design, and rigidity of tool support. Two heavy 15-in. carriages have been substituted for the four 5-in. carriages, but instead of reducing the number of tools that can be worked simultaneously in removing stock and finishing the work, the number is increased, as each of the two carriages can now carry more than one tool, which was before impossible. The other most important change is the placing of the oiling system beneath the work instead of overhead.

This lathe is a single purpose machine, that is, it is built for a limited class of work, the turning of shafts, pins, studs, long forgings, &c., not over 3½ in. in diameter and 84 in. long, and with any number of diameters and shoulders. The machine previously described was 60 in. between centers. Range is intentionally sacrificed to output capacity in this machine as compared with the standard engine lathe, the purpose being the highest possible efficiency on small diameter work.

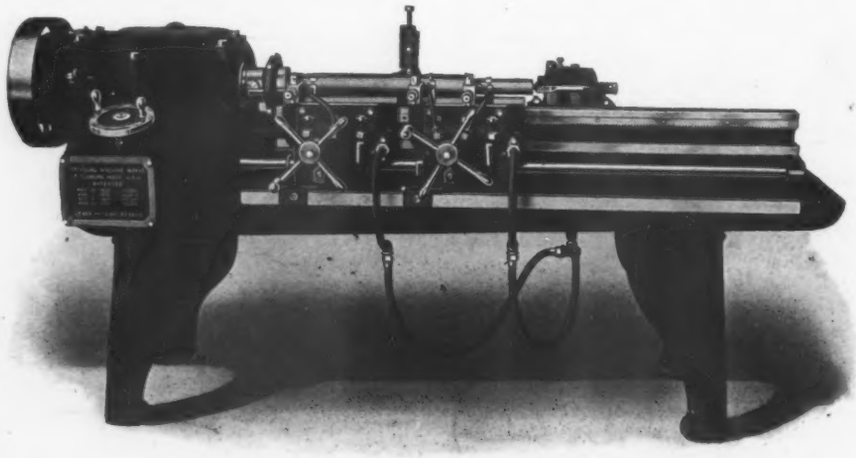


Fig. 1.—The Recently Improved Type of Lo-Swing Lathe, Built by the Fitchburg Machine Works, Fitchburg, Mass.

The new carriage, Fig. 2, like its smaller predecessor, is practically a solid block designed to bring the point of the tool as near as possible to the guide rail, which gives the great rigidity necessary when heavy cuts are being taken while reducing stock. There is great power in the tool, as all of the parts have been made with special regard to the requirements of the high speed steels. Each carriage has forward and reverse feed, and adjustable automatic stops are provided, which may be thrown into or out of adjustment at will. By the arrangement of tool holders, tools may be set close together, and a group of tools can work simultaneously on short pieces, as, for example, in Fig. 2, where three tools are in action.

The tool holders are low and long, with ample bearing surface as shown in Fig. 3, and offer no chance of yielding under working stress. The tool is a rectangular bar of high speed steel accurately fitting the holder, into which it is inserted nearly its full length, and is adjustable by a heavy screw that bears directly against its base in a straight line with the working thrust. The adjustable screw carries a swiveled yoke, into which the base of the tool is mortised, so that the screw is effective in withdrawing as well as advancing the tool. The two are then inserted into the holder and the screw is turned until the tool is projected the required amount, as indicated by a graduated collar. Unyielding adjustments of great precision are quickly made.

High speed fixed and follow roller rests are provided, which are quickly released and swung from the working position. The steady rest can be rigidly clamped to the bed anywhere between the head and tail centers. The carriages pass the steady rest as well as the tail stock. The mounting of the follow rest is shown in Fig. 4, which also gives a striking indication of how closely the point of the tool is brought to the guide rail, transmitting the thrust to the solid metal of the rail. It will also be seen that the tool holder is as close as possible to the cutting edge, and that the adjusting screw acts in a direct line with the tool. As a consequence the tool is held against the work in a manner that prevents variations of adjustment from light to heavy chip and from slow to high speed.

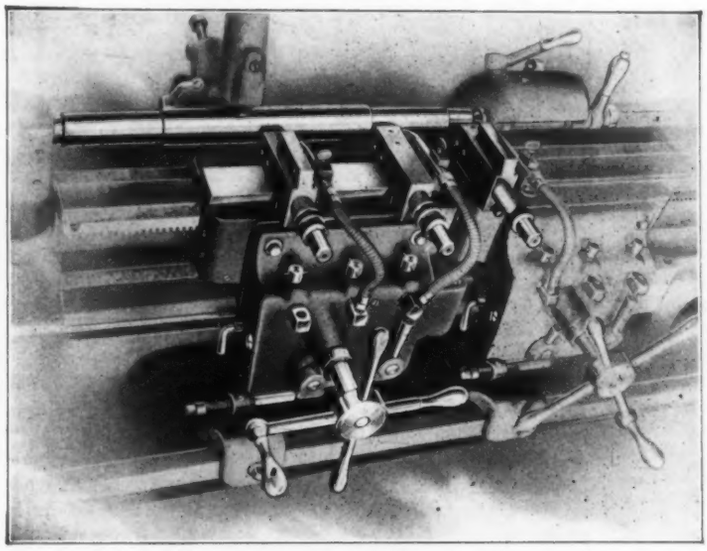


Fig. 2.—A Detail of One of the Carriages.

In the new system of supplying oil or other lubricant to the cutting points, replacing the overhead system, the supply tubes from the pump connection to the carriages are flexible. Within the carriages these supplies each branch to three outlets, which may be connected at will by flexible tubes to adjustable nozzles which play upon the tools. The pump is located in the rear chamber of the head, and if desired can be stopped by unscrewing a knurled screw in the vertical pump driving shaft.

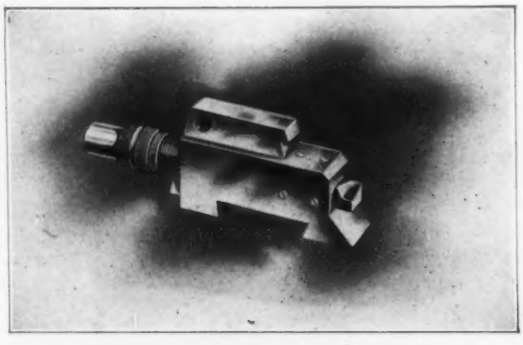


Fig. 3.—A Tool and Tool Holder.

Like its predecessor, the lathe is driven from a constant speed pulley intended to run at 560 rev. per min., and the spindle may be driven directly at this speed or through gears and clutches at six other speeds ranging down to 50 rev. per min. The short lever on the headstock projecting to the front controls one of the clutches, and the others are controlled by a knob operating a plunger inserted in the end of the spindle and by a bolt extending through the hub of the driving pulley. The system of gears and clutches is lubricated by the dipping of lower edges of some of the parts into an oil reservoir. The work runs on centers, but is revolved by a swivel drive which makes a slight deviation in the exact alignment of the spindle and work of no consequence. Variations of feed are obtained by manipulating the feed variator on the headstock. Figures on the wheel indicate what feed is in action; the range is from 10 to 100 revolutions per inch of travel. A feed is recommended as coarse as the nature of the work and the chip taken will permit. The feed disks run in oil, consequently it is important to keep a sufficient supply of lubricant in the feed chamber to reach to the top of the gauge glass.

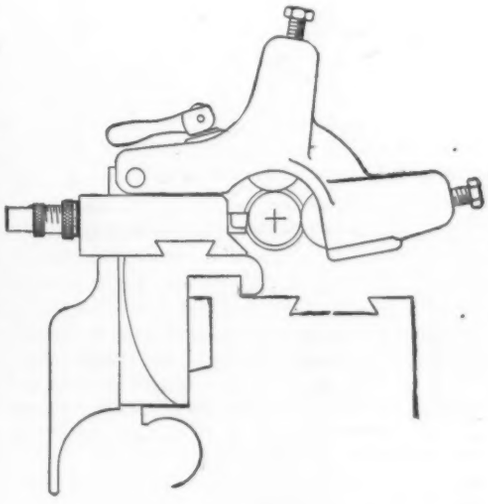


Fig. 4.—Diagram Showing the Relation of Parts.

Trust Conference in Chicago.

President Nicholas M. Butler of Columbia University, New York, has announced the programme for the trust conference to be held in Chicago October 22 to 25, under the auspices of the National Civic Federation.

The first day will be devoted to the problems involved in the controversies between the State and the Federal Government respecting jurisdiction over interstate commerce now waging in Minnesota, Missouri, North Carolina, Alabama and Arkansas. On the second day the corporation in general will be the subject of debate. Some of the questions to be taken up are: Should there be national corporations as well as State? What should be the basis of capitalization of corporations; their internal control; the provisions looking to the protection of investors and stockholders, as well as fair dealing with the public? Should there be a distinction between public service and other corporations? Should quasi-public utilities like gas, electric lighting and street railroads be considered natural monopolies to be regulated by the municipality?

The third and fourth days will be devoted to a discussion of the just and practicable limit of restriction and regulation, Federal and State, of combinations in transportation, production, distribution and labor. The sufficiency of the Sherman anti-trust act will be gone into.

Delegates have been named by Governors and by national labor, agricultural, manufacturing, financial, economic and trade organizations, by chambers of commerce, boards of trade, bar associations and shippers' organizations. The Commissioner of Corporations and two members of the Cabinet are expected to participate.

In accordance with the recent action of the American Railway Association and the Master Car Builders' Association, the Pennsylvania Railroad Company has notified its agents that beginning September 1 the placing of advertisements on freight cars of railroad ownership will be prohibited. Advertisements found on cars must be removed before the cars are forwarded over the lines of the railroad.

The Knoeppel Cupola Tuyere.

The fundamental principle of good cupola work is to introduce the required amount of oxygen with as little disturbance as possible, and in such a manner as to give an equal temperature at all points in the circumference of the cupola; in other words, to avoid cold spots. To accomplish this the blast must be uniformly distributed and the tuyere area must be large. If a cupola lining is allowed to take its own course and assume the form which it naturally would where the cupola is normally slagged, it will be found that the lining will build out slightly above the tuyere and form a bosh above. In view of these facts and of the necessity for large openings to deliver the air at the lowest possible pressure and to avoid irregularity, a tuyere system has been devised, as shown in the accompanying sectional and photographic views. The designer is J. C. Knoeppel, 577

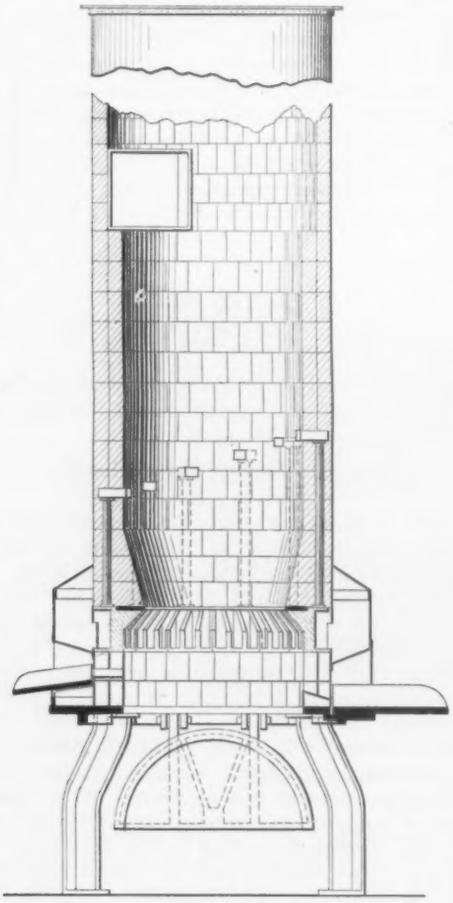


Fig. 1.—Vertical Section of a Cupola Equipped with the Knoeppel Tuyere.

East Ferry street, Buffalo, N. Y., who in his experience as a foundry manager in the past 20 years has given much attention to melting problems. Patents on the new tuyere are pending in the United States and Canada.

The castings composing the tuyeres form a continuous belt about the cupola. In large cupolas the upper and lower portions of the tuyeres are composed of separate castings, while for smaller ones each block is one casting. Fig. 1 is a vertical section through a cupola equipped with the Knoeppel tuyere. Fig. 2 represents the complete tuyere zone of the new construction. It will be seen that a safety notch is provided in the center, so that when the iron rises to this point it will flow through the depression and escape through a soft metal plate, thus warning the melter before the iron flows into the tuyere proper sufficiently to clog them. In this illustration one of the tuyere keys has been removed. In these the upper flange overhangs and rests on the top of the adjacent tuyere blocks, while the lower portion is made with parallel sides, so that it can be drawn in to the center of the cupola, thus releasing the other tuyere blocks. Above the spout and above the slag hole the blocks usually have their lower tier of openings stopped with brick, so as to avoid any liability of chilling the outflowing slag or metal.

One of the most important points in connection with

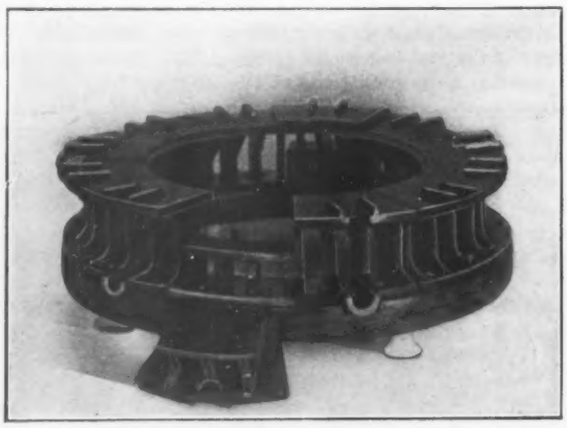


Fig. 2.—Assembled Blocks of the Knoeppel Tuyeres.—One of the Tuyere Keys Has Been Removed.

this form of tuyere is the fact that it may be said to have two independent wind belts, which will give the air a chance to equalize in pressure both inside and outside of the shell, thus insuring equal pressure at every tuyere opening. The outside wind belt is a metal casing, as in the better style of cupola mountings, while the inside belt is formed by cutting back the vertical partitions of the tuyere blocks at the side next the cupola shell, as shown in Figs. 1, 2 and 3. A series of openings through the

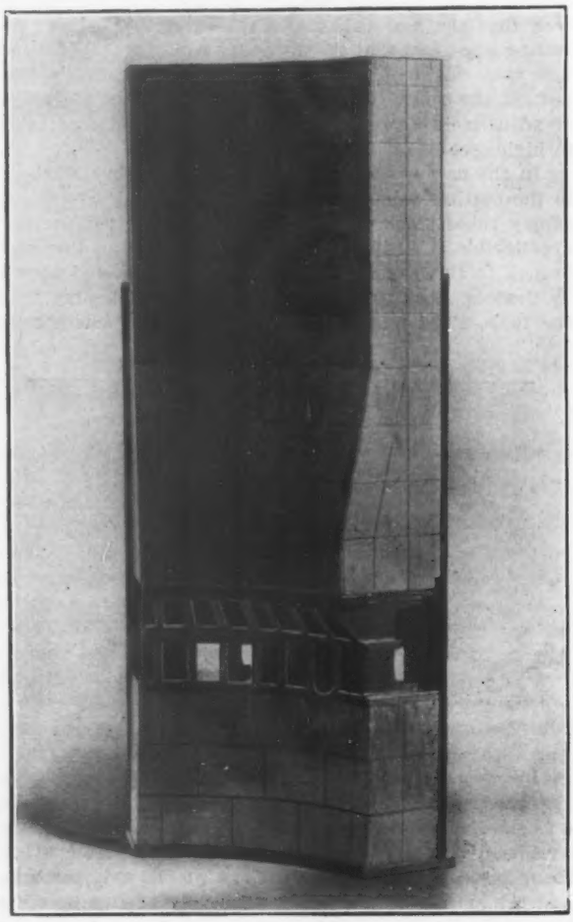


Fig. 3.—Small Section of Cupola Lining, Showing Tuyere and Inside Wind Chamber.

shell admits air to the back of the tuyere blocks, and this air then flows about through the inside air space. By making the tuyere area ample, the air flows at a relatively slow velocity and has opportunity to lag or rest in the tuyeres for a short space of time, thus enabling it to take up some heat and to enter in the best possible con-

dition for rapid combustion. In the usual construction, the lining is carried up vertically for a short distance above the tuyere blocks and then caused to flare out, forming the bosh. The brick lining is supported by angle irons riveted to the shell, as usual, so that the tuyeres can be removed, if it is desired to make any change in their arrangement.

One of the features covered in Mr. Knoeppel's patent is the provision for the introduction of air above the melting point, the object being to utilize to the fullest possible extent the heat contained in the gases. There are notches in the top of the tuyere blocks which connect with vertical pipes next the shell on the inside of the cupola and the latter are provided with nozzles leading through the lining. The pipes and the upper openings through the lining appear in Fig. 4. The nozzles are secured to the pipes with dovetail joints, so that they can be easily replaced. In operation during melting a small amount of air is admitted through these vertical pipes and combining with the carbonic oxide gas produces carbon dioxide. The heat thus set free will be absorbed to a considerable extent by the material as it settles toward the melting point, thus conducing to rapid melting. These

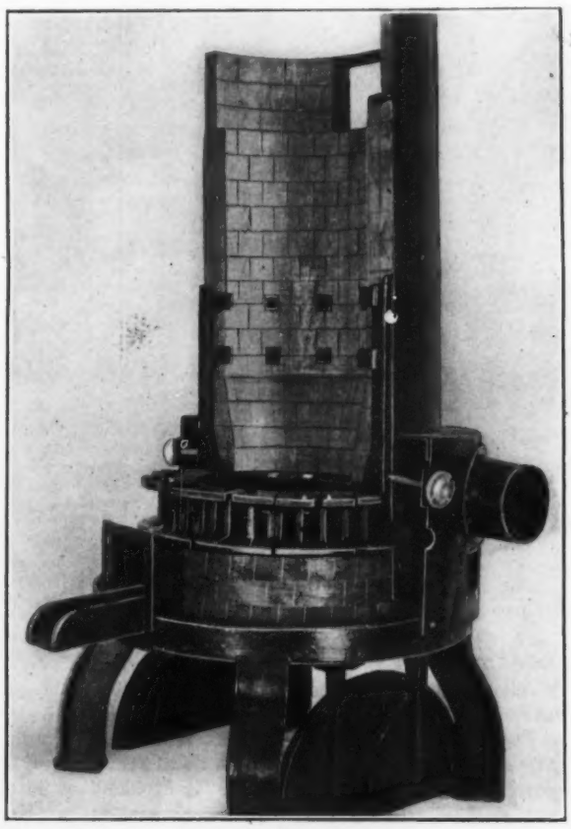


Fig. 4.—Section of a Cupola in Model, Showing the Knoeppel Tuyeres in Place, with Air Pipes Leading to Upper Openings in the Lining.

vertical pipes can be closed with dampers or valves, which can be used to adjust the amount of air admitted above the melting point. At the end of the heat the dampers in the vertical pipes can be opened wide and a volume of air allowed to pass up through the pipes, so as to cool the lining.

In the case of very small cupolas, the amount that the tuyere overhangs on the inside would be reduced, and possibly in some cases this overhang would be entirely dispensed with and flush or vertical tuyeres used. In such cases Mr. Knoeppel supplies cast iron plates, which can be placed on top of the tuyeres so as to form an overhang of from 1 to 2 in., thus providing for a small amount of boshing. In cupolas of large or moderate size the tuyeres project from 2 to 16 in., and thus the air is delivered much nearer the center of the cupola than in cases where the tuyeres are flush with the lining.

Estimation of Carbon with the Shimer Crucible.

BY GORDON C. MILLS, SYDNEY MINES, NOVA SCOTIA.

A short time ago it became necessary for me to prepare a set of standard carbon steels for use with the Eggetz color test. Consequently it was necessary to get very accurate results with my combustion apparatus, which happened to be a Shimer combustion crucible, the only type available in this laboratory. Having always previously used the ordinary combustion tube apparatus it was necessary for me to use great caution in its manipulation. But, however carefully I made my determinations, I could not obtain good results, my checks coming out badly. Having convinced myself beyond all possible doubt that the defect did not lie with my absorption or purifying train I turned my attention to the Shimer crucible and so discovered my trouble.

Upon examining the copper tube which carries away the products of combustion to the copper oxide tube I found the inside thickly coated with a deposition of fine carbon dust. Thus, obviously, this was caused by particles of unburnt carbon being carried or swept up the tube by the current of air or oxygen aspirated through the apparatus. This I proved to be the case, however slowly I aspirated my current of oxygen or air. Owing to the copper tube being water cooled it undoubtedly aided in the deposition of the carbon and thus remained unburned. It was now easy to explain the variable results which I got from the apparatus, for the strength of the current and the temperature of the combustion must vary with each determination, and so assist or retard the deposition of unburnt particles of carbon.

The remedy I employed to overcome this serious defect was simple, but effective. I had a small platinum capsule, well perforated with small pin holes, similar to a very small Gooch crucible, fitted over the end of the copper exit tube, inside the Shimer crucible. Thus, all the gases passing were filtered, and any solid particles of carbon were held back, the small platinum filter retaining sufficient heat by radiation to convert any particles of carbon to CO or CO_2, thus preventing the holes being blocked up.

The efficiency of this device was clearly demonstrated by the exceedingly concordant results which I was afterward able to obtain, as previously I was on the point of discarding the apparatus as unreliable. I also found that the rubber bands supplied with this apparatus were clumsy and liable to get jammed down the crucible and so get burned. I obtained much better results and also much tighter joints by using a rubber band about ¼ to ⅜ in. broad, made by cutting a small piece off an ordinary ⅜ to ½ in. in diameter black rubber tube, which is easily stretched over the stopper.

The following are a few check results I obtained upon the same sample of steel:

Sample No.	Check results obtained without the use of platinum cap. Per cent.	Check results with the use of platinum cap as described. Per cent.
8	0.3612	0.3732
	0.3752	0.3740
	0.3664	0.3736
Average result	0.3676	0.3736

This is by no means an exaggerated example of the results I obtained, but a decidedly fair average one.

The new steel bridge of the Chicago & Alton over the Sangamon River, near Springfield, Ill., has been made almost noiseless, the vibrations of the ironwork when a train crosses being almost entirely eliminated by laying 8 in. of ballast between the ties and the steel structure. There is said to be less noise when a train crosses this bridge than when running along the ordinary roadbed. The extra expense for the ballast and heavier bridge members required makes the construction more practicable for short spans than for long ones, but its value for elevated tracks is great.

Newfoundland's Iron Mines Under the Sea.

A correspondent of the *Canadian Mining Journal* has visited the Wabana, Newfoundland, iron mines from which the Dominion Iron & Steel Company, Sydney, Novia Scotia, and the Nova Scotia Steel & Coal Company are drawing their supplies, and gives some facts concerning the work now being carried on in developing the submarine portions of these deposits. Wabana is the chief port of Bell Island, which is in Conception Bay, Newfoundland. It is 400 miles distant from Sydney harbor and 500 miles from Halifax. Bell Island is 8 miles long and 2 miles wide and has about one-fifth of its surface laid or underlaid with ore. One bed is chiefly on the surface and the other underlies it by 230 to 240 ft. The two companies have estimated that the land ore amounts to 30,000,000 or 40,000,000 tons. Indications are that much larger bodies exist under the sea, the continuation of the land seams, which have a dip of a foot in 12 or 13. Through a portion of the lower seam, owned by the Dominion Iron & Steel Company, the Nova Scotia Steel & Coal Company is now driving a slope, by agreement between the companies. The present length of the slope is 1600 ft. through land ore and 1200 ft. through ore submarine. As the sinking progresses the thickness of the seam increases and the quality of the ore improves. At the outcrop the ore is 6 ft. in thickness; at the face of the slope the thickness is 15 ft. At the outcrop the ore runs from 49 to 52 per cent. of iron; at the face analysis gives 56 per cent. R. Chambers, superintendent of operations at Wabana, for the Nova Scotia Steel & Coal Company, says that under the sea the seam is as regular as on land, and nothing has been encountered to indicate that the seam may not continue for miles under the water. In that event the quantity may have to be figured in hundreds of millions of tons instead of millions. Between Bell Island and the mainland of Newfoundland the distance is eight miles. It is known that the submarine ore areas do not continue the entire distance. Few extra expenses will be encountered in mining in the deep portions. The principal one will be haulage, but modern systems are employed. The system of mining is modified board and pillar. With 671 men at work the Nova Scotia Company produces 1400 tons a day, and the total number of men employed in mining on the island is 1400 to 1500. All the ore on coming from the ground goes through a crusher. It is discharged on a wide rubber belt which carries it up at a steep angle. As it passes up it is cleaned by pickers. For storage pending loading into vessels a great pocket is provided, largely formed by a natural recess in the high cliffs. Its capacity is 24,000 tons. A door in the artificial floor of the pocket permits the ore to fall upon a conveyor which carries it to a chute at the pier and empties it into vessels.

Large Copper Elbows.

Made by the Fore River Shipbuilding Company.

As examples of heavy copper pipe work, the offset elbows shown in the accompanying illustration are particularly interesting, being of unusual weight and size. These two copper elbows are in the main exhaust lines of the Curtis' turbine steamship Creole, and were made at the copper shop of the Fore River Shipbuilding Company, Quincy, Mass., the builder of the vessel. Each of these elbows weighs 2500 lb., is 42 in. in diameter inside and 5-6 in. thick. Four pieces of sheet copper were used in the making of each elbow, and the skillfulness with which they were brazed together is apparent in their smoothness and shapeliness. As specimens of excellent workmanship they will appeal to all coppersmiths, for these elbows are nearly, if not quite, the largest copper ones ever made in this country for marine purposes. The Fore River Company makes all kinds of copper and steel piping of any shape or size for pressures up to 300 lb. for use in power plants, distilleries, breweries, &c.

Two Large Offset Copper Elbows Made by the Fore River Shipbuilding Company, Quincy, Mass.

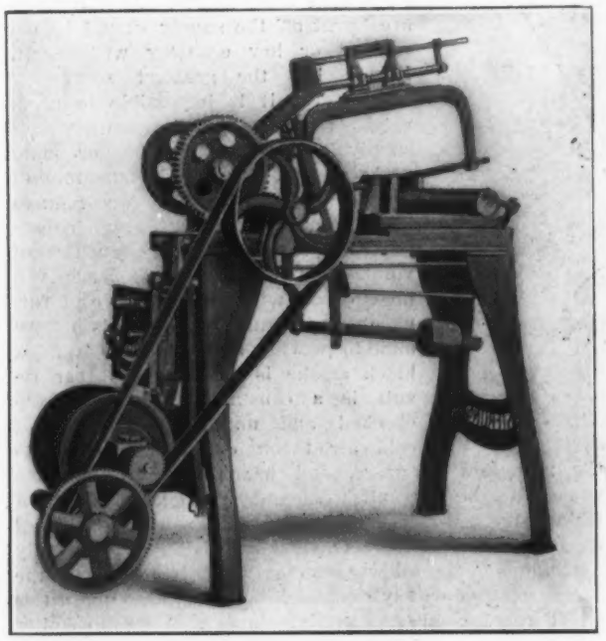
The prosperity of the British iron trade in the past year or two is reflected in the dividends of some of its iron and steel companies. The Consett Iron Company, Ltd., made a profit of £498,000 in its last fiscal year, or £195,000 more than in the preceding year. A dividend of 40 per cent. on the ordinary shares was declared. Guest, Keen & Nettlefolds, Ltd., after declaring the usual dividend of 5 per cent. per annum on the preference shares, distributed 10 per cent. on the ordinary shares, together with a bonus of 1 s. per share. Bolckow, Vaughan & Co., Ltd., declared a dividend of 10 per cent. for the year ending June 30. The directors recommended the expenditure from the profits of the year of £210,000 on extensions of plant and reduction of capital, carrying to surplus £158,000.

Wall Street is thus defended by President James J. Hill of the Great Northern Railway Company: "A bad feature of the situation—bad because it is misleading—is that the newspapers, and individuals through the newspapers, are continually shouting that Wall Street is in a bad way. But what is Wall Street? Who does business here? People forget that the business men of every town in the country do business in Wall Street. It is the clearing house of the United States. Plain, simple Wall Street gets its commission whether things go up or down. In its broader and truer sense, it is the pulse of our business and commercial activities."

The Sterling Motor Driven Hack Saw.

It is so commonly most convenient to drive a power hack saw with an electric motor of its own that the Diamond Saw & Stamping Works, Buffalo, N. Y., has lately standardized motor application to its Sterling saw. The machine itself as at present built was described in *The Iron Age* August 17, 1905, and as it appears with a self-contained motor it is illustrated herewith. In this form it is most suitable in shops where individual driving of tools is a practice, and it is expected to be particularly useful to tool and machinery houses where power facilities are not usually provided, but where either direct or alternating current is used for lighting. Motors are made for either kind of current and are attached to the saw as a part of the machine unit. Those for direct current are bipolar type, wound for 110 or 220 volts, and under special conditions for 500 volts. The alternating current motors are supplied for 110 and 115 voltages and for 25, 60 or 133 cycles.

The direct current motors are designed with special reference to the duty to be performed, being of slow



A Sterling Power Hack Saw with Attached Motor, Made by the Diamond Saw & Stamping Works, Buffalo, N. Y.

speed type, very strong construction and capable of a considerable overload. They are entirely incased, making them dust and moisture proof, and have large oil wells and ring oilers. The speed regulating rheostat supplied is of special fireproof form and is mounted as a unit with the motor on a special base, which is secured to the rear legs of the machine. Either the motor or rheostat is easily detachable for inspection or repair. To make the driving noiseless the motors are provided with fiber pinions. An important feature of the direct current motors is the shifting slide on the rheostat, by which the stroke of the saw can be regulated from 45 per minute for cutting off tool steel to any higher speed required up to 55 strokes, which speed can be used for cutting off bars of machinery steel or cold rolled shafting.

The alternating current motors are of constant speed, self-starting type, having no brushes or commutators, and are perhaps the simplest form of motive power possible. Although these motors are designed for single phase current, they may be run on one side of a two or three phase system.

The Sterling power hack saw machines are fitted with a special attachment by which long bars, angle irons or other kinds of stock can be cut off at an angle of 45 degrees or more if required. These machines are manufactured in lots of 200 at a time and the company is thereby enabled to produce them economically.

The Vienna Meeting of the Iron and Steel Institute.

The autumn meeting of the Iron and Steel Institute will be held in the house of the Austrian Engineers' and Architects' Society in Vienna (I. Eschenbachgasse, 9), on Monday and Tuesday, September 23 and 24, 1907, commencing each day at 9.30 a.m. The programme of proceedings, as given in a circular issued by Sir Hugh Bell, president, and Bennett H. Brough, secretary, is as follows:

Monday, September 23.

, The president, council and members will be welcomed by the Reception Committee, by the Government and civic authorities, and by the president of the Society of Engineers and Architects. Scrutineers will be appointed for the examination of the voting papers. A list will be submitted of vice-presidents and members of Council retiring by rotation in May, 1908. Selection of papers will be read and discussed.

Tuesday, September 24.

General meeting in the house of the Society of Engineers and Architects. The following is a list of papers that are expected to be submitted: "The Development of the Iron Industry of Austria Since 1882," by W. Kestranek, chairman of the Reception Committee; "The Styrian Erzberg Iron Ore Mines," by Prof. H. Bauerman; "Steel and Meteoric Iron," by Prof. F. Berwerth, Vienna; "The Determination of the Quantity of Blast Furnace Gas for a Given Make of Pig Iron," by Prof. Josef von Ehrenwerth, Leoben; "The Application of the Laws of Physical Chemistry to the Metallurgy of Iron," by Baron H. von Jüptner, Vienna; "Case Hardening of Mild Steel," by C. O. Bannister, London, and J. W. Lambert, Woolwich; "A New Blue-Black Paint as a Protective Covering for Iron," by F. J. R. Carulla, Derby; "The Hardening of Steel," by L. Demozay, Unieux, France; "The Structure of Hardened Steel," by Percy Longmuir, Sheffield; "Case Hardening," by G. Shaw Scott, Birmingham; "The Aging of Mild Steel—Further Notes," by C. E. Stromeyer, Manchester; "The Economical Distribution of Electric Power from Blast Furnaces," by B. H. Thwaite, London.

The Simplon tunnel through the Alps has had to fall back upon steam locomotives fitted with smoke consumers, as a new difficulty has been experienced upon the introduction of the three-phase electric locomotives loaned by the Valtellina Railway. It appears that these tractors, which take up with their cross section almost the entire available section of the tunnel, act much like a projectile, in that they push large quantities of air before them, with consequent great consumption of power and diminution of speed. Also, in going from the cool outside air into the tunnel atmosphere, which is warm and very moist, they become covered with a profuse condensation. Some of the motors have broken down, because, it is supposed, of moisture penetrating the insulation. Modifications are being made with a view to adapting these motors to the new conditions. This is another example of an engineering difficulty which could not well have been foreseen, but which will be eventually overcome.

Recovery from overstrain of nickel and carbon steel has been recently investigated by testing ordinary structural steel and similar material with 3½ per cent. of nickel added. An overstrain by either tension or torsion was found to destroy the elasticity, but this gradually returns when the piece is allowed to rest, the elastic limit becoming sometimes greater than originally, and the modulus of elasticity about the same as at first. The elastic properties of the overstrained material are restored by immersion for a short time in boiling water. Recovery is not aided by repeated impact from a light hammer. Materials overstrained in either tension or compression lose their elasticity for stress of the opposite kind, but this is restored by rest. The carbon steel seems to recover somewhat more quickly than does the nickel steel.

The Caldwell Mechanical Coal Shovel.

The simplicity of hand firing with the economy of mechanical stoking is the combination claimed to have been effected in the Caldwell automatic mechanical coal shovel made by the Sarco Fuel Saving & Engineering Company, West Street Building, New York City. As distinguished from the familiar over-feed, under-feed and chain-grate types of stokers, the Caldwell mechanical shovel is classified as of the strewing type. The working of the shovel may be comprehended in a moment, and is described in the following paragraph, but the reasons for its effectiveness are not so instantly apparent to those who have not made a study of coal combustion, and are explained in subsequent paragraphs.

The principal parts of the shovel are shown in the cross sectional view given in Fig. 1, and the general appearance of a row of these stokers is shown in Fig. 2, a view taken from an installation. The coal is fed in from an overhead hopper, and issuing from the bottom of it falls in front of the reciprocating ram A, Fig. 1. This at each forward move deposits a small charge of coal, B, in front of the oscillating shovel, C, the edge of

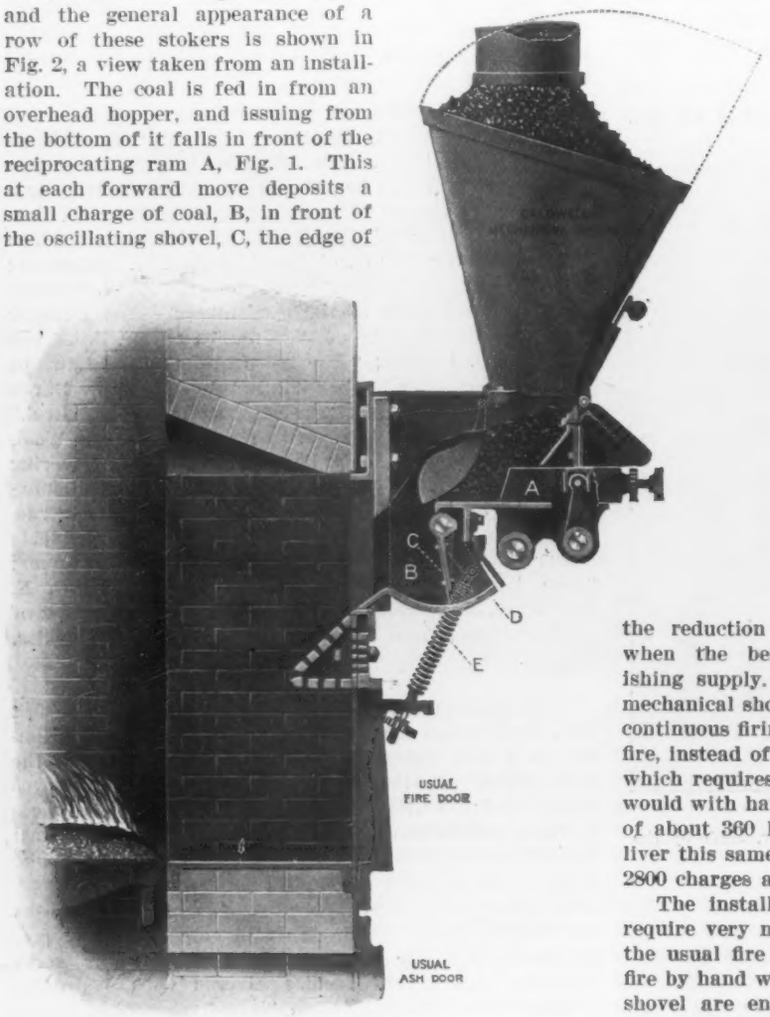


Fig. 1.—Sectional View of the Caldwell Automatic Mechanical Coal Shovel, Made by the Sarco Fuel Saving & Engineering Company, New York.

which swings close to the bottom of a curved pan, D. Between the depositing of each charge in front of the shovel the latter is drawn backward by a cam and then released, when it is snapped forward by a strong spiral spring, E, projecting the charge upon the grate. A simple mechanism is provided for varying the tension of the spring, so that the distance to which successive charges are thrown is altered to distribute the coal uniformly over the grate surface. The changes in the tension of the spring are gradual and are automatically made. One shovel will thus distribute the coal evenly over about a width of 3 ft., so that it is desirable to have one shovel for each 3 ft. in width of the furnace.

The ideal sought with all stokers is perfect combustion, for it means the most economical use of fuel and the greatest efficiency from the fire. The amount of smoke issuing from the stack is a very accurate index of how nearly the ideal conditions are approximated, for there is no black smoke when the carbon in the coal is completely consumed to carbon dioxide (CO_2). When coal is heated the volatile gases are driven off, carrying with them fine particles of carbon which are the cause of black smoke. This smoke lasts only while the gases are separating from the solid fuel. If the gases are heated to ignition they unite with the oxygen in the air, and when the proper supply of air is afforded and the temperature is sufficiently high the gases are wholly consumed. In this case carbon dioxide is formed and the full heating value of a pound of carbon, 14,600 heat units, is realized. If the air supply and temperature are insufficient carbon monoxide (CO) is formed with an evolution of heat of only about 4500 units per pound of carbon, or about one-third of that attending perfect combustion. The only other condition necessary to avoid smoke is disturbing the fire as little as possible.

Throwing large amounts of green coal over the surface of the fire, having a very deep fire, or having a deficient draft all affect the vital conditions. To consume the volatile gases it is necessary to introduce some air over the fire, mixing it with the gases at a high temperature. As the gases are burnt off the supply should be decreased or low economy will result. Herein lies the greatest source of trouble, for it is impossible to accurately regulate this intermittent air supply either automatically or manually. Hand firing large amounts of green coal at wide intervals reduces the furnace temperature and causes sudden release of large quantities of volatile gases, demanding large volumes of air within the furnace at furnace temperature, which it is impossible to provide, and consequently thick black smoke is emitted. Another result is a constantly increasing, unchecked and unregulated supply of cold air through the bed, owing to the reduction of gases, and which comes at a time when the best results demand a constantly diminishing supply. These evils, it is claimed, the Caldwell mechanical shovel corrects, since it provides a practically continuous firing, allowing a steady supply of air over the fire, instead of widely separated firing of large quantities which requires intermittent air supply. A 600-hp. boiler would with hand firing call for five coal charges per hour of about 360 lb. each; the mechanical shovel would deliver this same quantity of coal in the same time in over 2800 charges and without opening the door.

The installation of the mechanical shovel does not require very material alterations of the boiler front, for the usual fire door is retained; in fact, it is possible to fire by hand when the shovel is installed. The grate and shovel are entirely separate from each other, and the grate may be of any kind to suit any kind of coal. This is a principal difference between the Caldwell mechanical shovel and other stokers.

It is not claimed that in practice no manual attention is required, but that only brief periods are necessary, and these at wide intervals. The ashes are disposed of in exactly the same way as in hand firing. If shaking grates are used, as they can be, and are nine times out of ten, the ashes are shaken through to the ashpit at stated intervals. If dumping grates are used the ashes are dumped in the usual way. In any case the work is of short duration, and occurs about two or three times a day. The grate can be continuously shaken by the shovel mechanism as is sometimes done, but the small job of shaking by hand at wide intervals is nearly always considered better practice.

There are two principal reasons why stoker grates burn out, one is that stoker equipped boilers are commonly forced beyond their rated capacity, which must mean a hotter fire and naturally an increased number of burn outs. The other reason is that the grates are not afforded the protection of a coating of ashes that gathers on the surface where hand firing is practiced or where

mechanical shovels are used. When this coating of ashes is removed by the sliding of the coal down the grate the iron is exposed to the high temperature of the furnace.

In brief, the shovel would seem to have these advantages: the retention of the best features of hand firing; ability to use any grate, therefore any coal, maintain efficient and consequently smokeless combustion, which means more heat for the same grate area; fewer repairs, and all the saving resulting from automatic conditions and closed fire doors.

Customs Decisions.

Over Valuing by Importers.

The Board of United States General Appraisers has decided that no relief can be granted importers when excessive values are placed on merchandise as a result of carelessness. The decision draws a line between a manifest clerical error and negligence. The case before the customs tribunal related to a second-hand automobile imported by Daniel H. Burdett, New York. The machine was entered at the Custom House as being worth 15,000 francs, whereas the selling price of a new car of the same type ranges from 11,000 to 11,500 francs. Accepting the importer's valuation, the collector assessed duty at the rate of 45 per cent. on the invoiced price. Against this action the importer appealed on the ground that it was manifest that an error had been made.

Eugene G. Hay, who writes the decision for the board, says that if it was clear that the invoiced price was a clerical error in the usual sense it would be the duty of the tribunal to grant redress, but in the case at bar the General Appraiser states that the testimony fails to show any mistake for which relief can be granted. In overruling the protest the decision says in part: "The excessive value stated in the invoice resulted from the grossest neglect or carelessness upon the part of the owner of the car or those whom he intrusted to manage its importation for him. The testimony does not show that the agents who made out the invoice and looked after the forwarding of the car from France, or the brokers who made the entry, made any error or mistake or placed any other figures upon the invoice or the entry than those they intended. The fact that the car is assessed at a higher value than its true value is therefore the result of the carelessness and neglect of either the importer or his agent. From the results of such carelessness and neglect this board has never gone so far as to grant relief upon the ground of clerical error."

Minor Decisions.

The board has acted unfavorably to the importers in an appeal filed by the Greist Mfg. Company, New Haven, against the assessment made by the collector on sewing machine beads. The articles were returned for duty as manufactures of metal at 45 per cent., and were claimed to be free of duty under the provision in the tariff act for patterns and models of invention.

A protest filed by C. B. Richard & Co., New York, asking a lower duty on brass swivels, has been sustained. The collector is directed to reliquidate the entry accordingly.

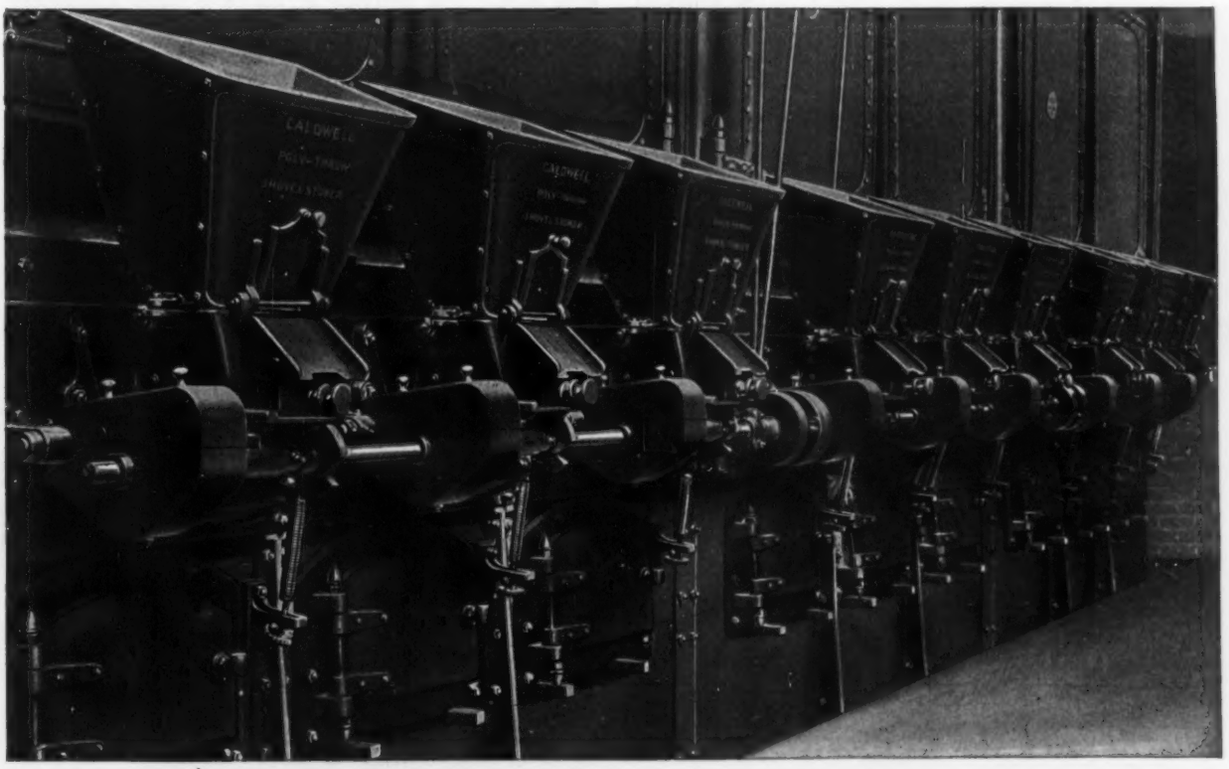


Fig. 2.—An Installation of Caldwell Shovel Stokers at the International Paper Company, Palmer's Falls, N. Y.

The Vilter Mfg. Company, Milwaukee, Wis., has received what is said to be the largest single order for a refrigerating plant ever placed in this country. The contract is from the Illinois Steel Company for its South Chicago plant. The machinery will have a capacity equal to the melting of 1100 tons of ice per day. This refrigeration will be used to dry the air for blast furnaces. The equipment will consist of four cross compound condensing engines, each engine driving two double acting ammonia compressors. The steam cylinders will be 24 and 46 in. in diameter by 36 in. stroke, and the ammonia compressors 18 x 36 in. There will be furnished 100 coils of double pipe ammonia condensor and 80 coils of double pipe brine cooler and the necessary oil traps and other machinery. The equipment will cost $115,000.

Reports to the effect that the Wisconsin Malleable Iron Company, Milwaukee, Wis., is contemplating the removal of its plant from Milwaukee to Racine are without foundation. The company states that it has not the slightest idea of moving its plant from Milwaukee.

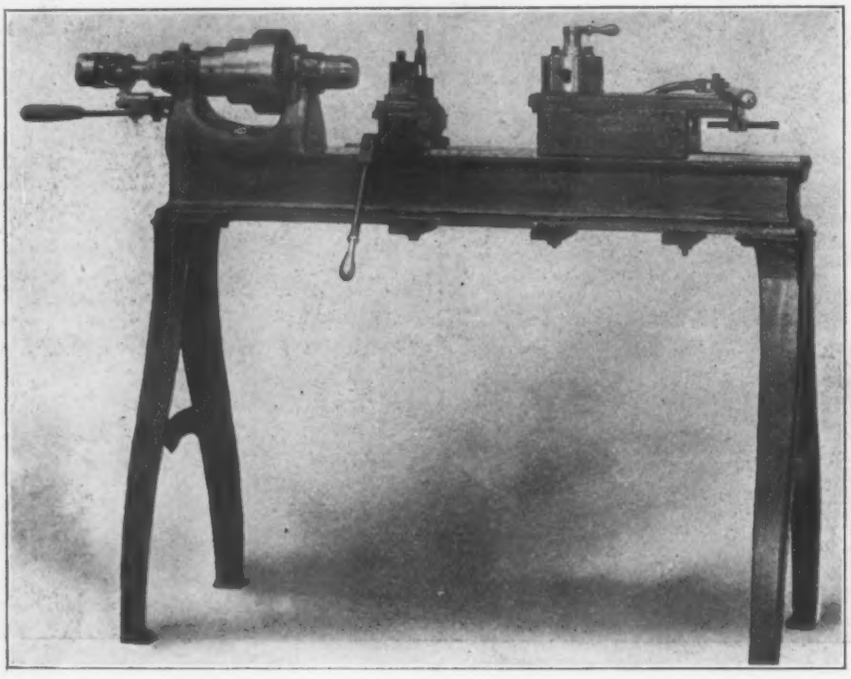
The Monongahela River Consolidated Coal & Coke Company, Pittsburgh, has an annual output of 7,500,000 tons, which is considerably more than the 1,500,000 tons credited to it in a recent issue of *The Iron Age*, and received from what appeared to be an authentic source.

The Wells Manufacturers' Lathe.

Appreciating the need of a moderate priced accurate lathe for drilling, tapping, threading and forming small machine parts, the F. E. Wells & Son Company, Greenfield, Mass., now offers the manufacturers' lathe shown in the accompanying engraving. In general design the lathe is similar to other lathes manufactured by this company reduced to the simplest essential parts. It swings 11 in., and is made in 3, 3½ and 4 ft. bed lengths. The head is cast in one piece with the bed, a distinguishing feature of Wells lathes, and carries a three-step cone pulley.

An automatic chuck of ¾-in. capacity is fitted to the spindle, and is operated by a lever that will open or close the chuck while the lathe is running, so that small pieces may be handled rapidly. For machining larger pieces such as castings and forgings, any geared or scroll chuck not larger than 8 in. in diameter may be placed on the end of the spindle after removing the cap. When desired a wire feed can be furnished for handling rods.

In lieu of a tailstock a turret slide is provided, equipped with a four or six hole turret and operated by a lever as shown. With an equipment of a comparatively few interchangeable tools this lathe is capable of performing a variety of work that is often done on a hand screw machine, and is better adapted for such work and much less expensive. The double cut-off slide is of a new and substantial design. It is also operated by a lever, and carries two tool posts for holding rigidly, straight shank tools and a circular forming tool. There are no gears or feed screws on any part of the lathe.



A New Manufacturers' Lathe Built by the F. E. Wells & Son Company, Greenfield, Mass.

Important researches upon the use of high pressure steam, (up to about 1500 lb. per sq. in.), in steam turbines have been conducted by Dr. de Laval. He finds that the present tables giving the properties above 350 lb. pressure, (432 degrees F.), are unreliable, the values having been extrapolated. One remarkable deduction is that at about 640 degrees steam seems to have a maximum efficiency. This is apparently paradoxical, for theoretically the thermodynamic efficiency is greater the higher the temperature. The probable explanation is the rapid decrease in the latent heat as the critical temperature (689 degrees, according to Cailletet; 698, according to Regnault, is approached.

The San Francisco office of the National Tube Company has been removed from Sixteenth and Folsom streets to the Crocker Building.

Pennsylvania Railroad Tunnels to Be Ready in Two Years.

It is estimated by engineers that two years will see the completion of the Pennsylvania Railroad tunnel improvements in and about New York, and that within no long additional time trains will be running. The most backward portions of the work are the Manhattan terminal and the Sunnyside yard and terminal work in Long Island City. It is expected, according to the New York *Herald*, that the four East River tubes will be completed within a few months, only a few hundred feet out of the total of 3900 ft. between Manhattan and Long Island City remaining to be driven in three of them, while less than 1000 ft. remains in the fourth. An important feature of the tunnel system will be the Sunnyside yard in Long Island City. Swamps and salt meadows are being converted into solid yard and eventually 190 acres will be available for storage of cars and for making and breaking up trains. Fifty-five miles of track will be provided in this yard. The building of the New York Connecting Railroad, including the great Hell Gate bridge, will connect the New Haven Road's Mott Haven terminal with Bay Ridge and will create practically a new terminal at Brooklyn. From Bay Ridge all freight from New England will be taken across New York Bay in trainloads and landed in the Greenville, N. J., yards, which are to be greatly increased. In time a tunnel will be built under the bay, doing away with ferry service entirely. This is an important feature of the company's plans for the future.

At the terminal site, bounded by Seventh and Ninth avenues and by Thirty-first and Thirty-third streets, the excavation and blasting of two years have brought the workmen to the track level in most of the area, and steel framework will soon be started. Thus far 2,000,000 cu. yd. of rock and earth have been taken out east of Ninth avenue and carried away in scows from the foot of Thirty-third street. The two tubes under the North River were finished several months ago, and concrete work is now being done. From the Weehawken shaft is a stretch of tunnel west through the Bergen hills to the Hackensack meadows, a distance of 6590 ft., twin tubes 23 x 24 ft. having been drilled through solid rock. Between the Manhattan terminal and the North River is 1010 ft. of tunnel and excavation, not yet half completed.

The plans to be executed later in connection with the New York tunnel system involve the building of two more tunnels from Manhattan to Long Island City, south of the four East River tunnels now nearing completion.

The Ransom Water Tool Grinder.

Several new features are to be found in the belt driven water cooled tool grinder, Fig. 1, recently placed on the market by the Ransom Mfg. Company, Oshkosh, Wis. Important among these is the arrangement whereby the cooling water shoots through the rest instead of impinging on the top of it and being spattered about. After strength and stability, which are the first essentials in a tool of this class, the company lays most emphasis on the provisions for delivering water to the wheel. Grinders in which the wheel is partly immersed in water have the disadvantage, which amounts to a danger if the wheel runs at high speed, that the wheel after being at rest for a time absorbs sufficient water to throw it out of balance when it is started up. In the Ransom grinder there is no water on the wheel except when it is running. At such times a supply is delivered by a device of the same character as is used on the Landis grinder. This the company prefers to call a blower rather than a pump, because its action more nearly resembles that of a fan blower. The water pressure is created by centrifugal force, so that there is no occasion for valves or packings in any part of the water supply system, and there is no wearing surface below the water line. The idler pulleys around which the belt driving the blower passes are arranged so that they can be used as belt tighteners.

The large plate shown on one side of the machine,

Fig. 1.—A New Water Tool Grinder Built by the Ransom Mfg. Company, Oshkosh, Wis.

Fig. 1, is the side of the tank shown in Fig. 2, which extends into the frame of the machine and contains the water reservoir, blower and settling tank. The water is stored in the larger compartment of the tank, from which it is forced by the blower. The blower is connected with the stationary pipe which contains the regulating valve and leads to the nozzle, by a piece of heavy rubber hose instead of gas pipe. The hose permits the ready removal of the tank in the base when it needs to be cleaned out, and the hose itself may be very easily cleaned out when clogged. The hood or guard around the wheel is so constructed that all the water is directed to the spot where it is useful in the grinding. The rest being perforated, to allow the water to pass through, it is not necessary to have a big bowl to catch the water. After use the water drains to the settling pan, which is the smaller compartment of the tank shown in Fig. 2, and flows over the partition into the larger compartment. The tank holds enough water to last several weeks, and the settling pan is so large that it is not necessary to clean it except when a new wheel is put on. When cleaning does become necessary the tank which has all this sediment can be taken outdoors and cleaned out readily with a shovel.

The arbors are made of 0.5 carbon open hearth steel and the shafts in the machine and the countershaft are

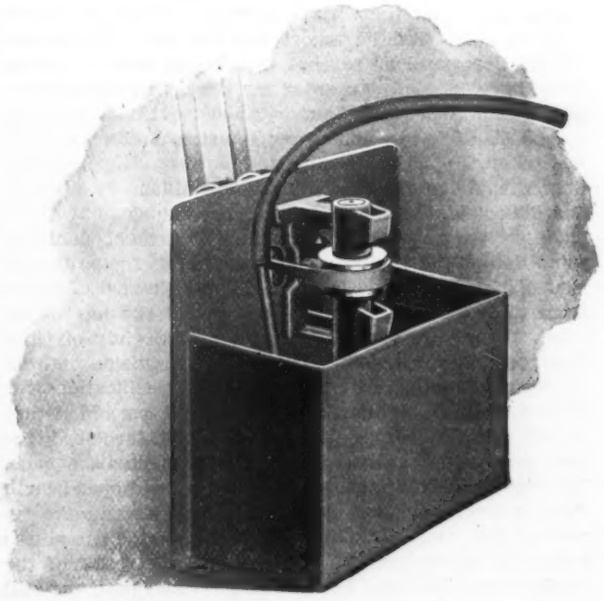


Fig. 2.—The Tank, Settling Pan and Water Blower Removed as a Unit.

ground and run in self-oiling boxes. The wheel is 20 in. in diameter by 1½ in. thick and runs on a 1 9-16-in. arbor. The machine occupies a space of 20 x 33 in. and weighs 800 lb. For truing the wheel an emery dresser can be instantly attached without removing the rest. The countershaft has an improved belt shifter, so that the belt is shifted by giving a half turn to a handle.

A mammoth water power is projected on the Des Moines rapids, at Keokuk, Ia. The dam to be erected will be next in size to the famous Assouan dam in Egypt, and the power developed second only to the largest plant at Niagara, the estimated output being 100,000 hp. The plant is expected to cost from $7,000,000 to $9,000,000, and the work is to be completed within two years. As there will be only one dam and lock in the river, instead of three, as at present, the Government will save $40,000 a year in transportation expenses. The dam will be 6000 ft. long and of stone, reinforced by steel. The power house will be of pressed brick and steel, and will be 1863 ft. long.

The possibility of a coal shortage in the Northwest in the coming winter similar to that which caused distress in the winter of 1906-1907 is already having attention. President Elliott of the Northern Pacific Railroad, in a letter to the Interstate Commerce Association, says that unless consumers buy ahead of time there will be trouble again about securing adequate fuel supplies. The federal Government has issued orders to all its departments in the Western States to secure a fuel supply before autumn.

A recently patented steam turbine of the reversing type uses two opposed sets of buckets, mounted back to back, only one of which is exposed to the action of the steam at any one time. Such a turbine, in effect, substitutes the idle buckets for the idle astern turbines used in Parsons' ship installations, with a possible considerable decrease in weight, complexity of parts and space occupied. At the same time the reversing power would be equal to that for going ahead, instead of being only a small fraction of the direct power.

Proposed Rail Specifications.

The Report of the Civil Engineers' Committee.

Publication has just been made in the Proceedings of the American Society of Civil Engineers of the progress report of the Special Committee on Rail Sections, which was presented at the City of Mexico meeting of the society in July. As the report had not been printed for distribution previous to that meeting it was not acted upon, but was made an order for the next annual meeting of the society in January, 1908. It is signed by Joseph T. Richards, chairman; Charles W. Buchholz, S. M. Felton, John D. Isaacs, R. Montfort, H. G. Prout, George E. Thackray, E. K. Turner, William R. Webster and Robert W. Hunt, secretary. Some changes have been made in the report of the majority of the committee, submitted at the January, 1906, meeting of the society in New York. That report provided for a discard of 40 in. from the end of the bloom formed from the top of the ingot. It also prescribed the American Society of Civil Engineers' sections, adopted in 1893, a provision omitted in the City of Mexico report. In the specifications for basic open hearth rails the proviso has been added that a full chemical determination shall be furnished for each heat and that two drop tests be made from each. The chemical requirements for Bessemer and open hearth rails, respectively, are the same as provided in the report of last year. It will be noticed that the committee expects to recommend new sections, as the result of the conferences that have been carried on and that are still to take place between the committees of various organizations and representatives of the railroads and the steel manufacturers. The report is as follows:

Your committee respectfully report that they have given the report which they submitted under date of January 17, 1906, and which was referred back to them, careful consideration, and would now report that they are in consultation with committees representing other societies and organizations, as well as other interested parties, on the subject of modified rail sections, with the purpose of preparing and submitting to your society a new series of such sections.

In this designing of heavier sections, particular attention is being given to the advisability of increasing the percentage of metal in the webs and flanges, as compared with the existing sections recommended by your society. This they hope to accomplish in due time, and in the meantime respectfully submit to the society for its consideration the following specifications for the manufacture of Bessemer and open hearth rails:

Bessemer Steel Rails.

Process of Manufacture.—The entire process of manufacture and testing shall be in accordance with the best state of the art, and the following instructions shall be faithfully executed:

Ingots shall be kept in a vertical position in the pit heating furnaces until ready to be rolled, or until the metal in the interior has had time to solidify.

No bled ingots shall be used.

There shall be sheared from the ends of the blooms formed from the top of the ingots not less than 25 per cent., and if, from any cause, the steel does not then appear to be solid, the shearing shall continue until it does. If, by the use of any improvements in the process of making ingots, the defect known as piping shall be prevented, the above shearing requirements may be modified.

The number of passes and speed of train shall be so regulated that on leaving the rolls at the final pass the temperature of the rail will not exceed that which requires a shrinkage allowance at the hot saws, for a 33-ft. rail of 100-lb. section, of 6 7-16 in., and 1-16 in. less for each 5-lb. decrease of section. These allowances to be decreased at the rate of 1-90 in. for each second of time elapsed between the rail leaving the finishing rolls and being sawn. No artificial means of cooling the steel shall be used after the rails leave the rolls, nor shall they be held before sawing for the purpose of reducing their temperature.

Chemical Composition.—Rails of the various weights per yard specified below shall conform to the following limits in chemical composition:

	70 to 79 lb. Percentage.	80 to 89 lb. Percentage.	90 to 100 lb. Percentage.
Carbon	0.50 to 0.60	0.53 to 0.63	0.55 to 0.65
Phosphorus shall not exceed	0.085	0.085	0.085
Silicon shall not exceed	0.20	0.20	0.20
Sulphur shall not exceed	0.075	0.075	0.075
Manganese	0.75 to 1.00	0.80 to 1.05	0.80 to 1.05

Drop Test.—One drop test shall be made on a piece of rail, not less than 4 ft. and not more than 6 ft. long, selected from each blow of steel. The test piece shall be taken from the top of the ingot. The rails shall be placed head upward on the supports, and the various sections shall be subjected to the following impact tests under a free falling weight:

70 to 79 lb. rails.....18 ft.
80 to 89 lb. rails.....20 ft.
90 to 100 lb. rails.....22 ft.

If any rail breaks, when subjected to the drop test, two additional tests may be made of other rails from the same blow of steel, also taken from the top of the ingots, and if either of these latter rails fail, all the rails of the blow which they represent will be rejected, but if both of these additional test pieces meet the requirements, all the rails of the blow which they represent will be accepted.

The drop testing machine shall have a tup of 2000 lb. weight, the striking face of which shall have a radius of not more than 5 in., and the test rail shall be placed head upward on solid supports 3 ft. apart. The anvil block shall weigh at least 20,000 lb., and the supports shall be part of, or firmly secured to, the anvil. The report of the drop test shall state the atmospheric temperature at the time the test was made.

Section.—The section of rail shall conform, as accurately as possible, to the templet furnished by the railroad company, consistent with the paragraph relative to specified weight. A variation in hight of 1-64 in. less, or 1-32 in. greater than the specified hight, and 1-16 in. in width, will be permitted. The section of rail shall conform to the finishing dimensions.

Weight.—The weight of the rails will be maintained as nearly as possible, after complying with the preceding paragraph, to that specified in contract. A variation of one-half of 1 per cent. for an entire order will be allowed. Rails will be accepted and paid for according to actual weights.

Length.—The standard length of rails shall be 33 ft. Ten per cent. of the entire order will be accepted in shorter lengths varying by even feet to 27 ft., and all No. 1 rails less than 33 ft. long shall be painted green on the ends. A variation of ¼ in. in length from that specified will be allowed.

Drilling.—Circular holes for splice bars shall be drilled in accordance with the specifications of the purchaser. The holes shall conform accurately to the drawing and dimensions furnished, in every respect, and must be free from burrs.

Straightening.—Care must be taken in hot straightening the rails, and it must result in their being left in such condition that they shall not vary throughout their entire length more than 5 in. from a straight line in any direction, when delivered to the cold straightening presses. Those which vary beyond that amount, or have short kinks, shall be classed as second quality rails and be so stamped.

Rails shall be straight in line and surface when finished—the straightening being done while cold—smooth on head, sawed square at ends, variation to be not more than 1-32 in., and prior to shipment shall have the burr occasioned by the saw cutting removed and the ends made clean. No. 1 rails shall be free from injurious defects and flaws of all kinds.

No. 2 rails shall be accepted up to 5 per cent. of the whole order. They shall not have flaws in their heads of more than ¼ in., or in the flange of more than ½ in. in depth, and, in the judgment of the inspector, these shall not be so numerous or of such a character as to render them unfit for recognized second quality rail uses. The ends of No. 2 rails shall be painted white, and shall have two prick punch marks on the side of the web near the heat number brand, and placed so as not to be covered by the splice bars. Rails from heats which failed under the drop test shall not be accepted as No. 2 rails.

Branding.—The name of the maker, the weight of the rail, and the month and year of manufacture, shall be rolled in raised letters on the side of the web; and the number of the blow shall be plainly stamped on each rail where it will not subsequently be covered by the splice bars.

Inspection.—The inspector representing the purchaser shall have free entry to the works of the manufacturer at all times when the contract is being filled, and shall have all reasonable facilities afforded him by the manufacturer to satisfy him that the finished material is furnished in accordance with the terms of these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment.

The manufacturer shall furnish the inspector, daily, with carbon determinations for each blow, and a complete chemical analysis every 24 hours, representing the average of the other elements contained in the steel, for each day and night turn. These analyses shall be made on drillings taken from small test ingots. On the request of the inspector, the manufacturer shall furnish drillings for check analyses.

Basic Open Hearth Steel Rails.

The specifications for rails made by the basic open hearth process shall be the same as for Bessemer rails, excepting that a full chemical determination shall be furnished

for each heat and two drop tests from each. Their chemical composition shall be:

	70 to 79 lb. Percentage.	80 to 89 lb. Percentage.	90 to 100 lb. Percentage.
Carbon	0.53 to 0.63	0.58 to 0.68	0.65 to 0.75
Phosphorus shall not exceed	0.05	0.05	0.05
Silicon shall not exceed	0.20	0.20	0.20
Sulphur shall not exceed	0.06	0.06	0.06
Manganese	0.75 to 1.00	0.80 to 1.05	0.80 to 1.05

The insistence of the railroad engineers on high carbons is exemplified in the above chemical requirements for open hearth rails. At present the Tennessee Coal, Iron & Railroad Company, which was first to roll open hearth rails on any considerable scale, is furnishing 0.50 to 0.60 carbon in rails of 70 to 80 lb., 0.55 to 0.65 carbon in 80 to 90 lb. rails and 0.58 to 0.68 carbon in 90 to 100 lb. rails. The Tennessee Company's phosphorus maximum is 0.06, and its manganese range differs from the above in having the maximum 1.05 per cent. for 70 to 80 lb. rails and 1.10 per cent. for heavier rails.

The American Locomotive Company.

The report of the American Locomotive Company for the fiscal year ended June 30 shows an increase in the net earnings available for dividends of only $177,514 over the preceding year. Although the gross earnings increased $6,967,610, this gain was nearly covered by the expansion in operating expenses, due to dearer labor and higher cost of materials. The income account is as follows:

	1907.	Increase.
Gross earnings	$49,515,486	$6,967,610
Operating expenses	42,744,381	6,659,010
Net earnings	$6,771,105	$308,600
Interest, bills payable, &c.	412,898	131,086
Available for dividends	$6,358,207	$177,514
Dividends, preferred (7%)	1,750,000	.....
Balance for common	$4,608,207	$177,514
Common dividend (5%)	1,250,000	937,500
Balance	$3,358,207	*$759,986
Additions and betterments	.....	*1,001,564
Balance	$3,358,207	$241,578
Extra additions and betterment fund	2,000,000	.....
Surplus	$1,358,207	$241,578
Previous surplus	6,605,373	1,116,629
Total surplus	$7,963,580	$1,358,207

* Decrease.

The condensed general balance sheet, as of June 30 last, shows:

Assets.

	1907.	Increase.
Cost property	$46,925,096	$272,829
Securities owned	3,396,915	450
Cash	2,654,230	1,551,300
Accounts collectible	10,399,961	1,101,484
Bills receivable	923,206	*159,517
Accrued interest	17,440	3,540
Advanced American Locomotive Automobile Company	1,772,260	1,119,922
Material and supplies	4,161,128	389,765
Contract work	4,195,943	*476,009
Locomotive & Machinery Company, Montreal	55,493	*15,929
Total	$74,501,672	$3,783,756

Liabilities.

Preferred stock	$25,000,000	.....
Common stock	25,000,000	.....
Bonded debt constituent companies—		
Richmond Locomotive Works	550,000	.....
Dixon Mfg. Company	562,500	.....
Rogers Locomotive Works	380,000	*$25,000
Locomotive & Machinery Company, Montreal	1,500,000	.....
Gold coupon notes	5,000,000	5,000,000
Accounts payable	4,516,740	436,366
Bills payable	.....	*3,300,000
Accrued interest	98,604	62,292
Unclaimed interest	2,237	*3,405
Dividends payable July 22	437,500	.....
Dividends payable Aug. 36	312,500	.....
Rogers Locomotive Works	870,870	*51,844
Extra additional and betterment fund	2,307,141	307,141
Profit and loss usrplus	7,963,580	1,358,206
Total	$74,501,672	$3,783,756

* Decrease.

In his report to stockholders, President W. H. Marshall says in part:

"The gross earnings include the revenue from the manufacture and sale of steam and electric locomotives, as well as extra boilers, tanks, cylinders, frames and other locomotive parts; also the manufacture and sale of steam shovels, dredges, trucks for electric service, rotary snow plows, &c.; the overhauling and general repair of old locomotives and income from investments and other sources. Included in expenses are all direct and indirect charges against manufacturing, maintenance and administration; also depreciation upon all property and equipment, and the adjustment of the book values of the material and stock on hand, the latter being confirmed by physical inventories taken June 30, 1907. In addition to liberal disbursements for the upkeep and replacement of the plants, included in expenses, there has been expended for improvements and additional property the sum of $1,692,858, which has been paid for out of the fund of $2,000,000 created June 30, 1906.

"In the fiscal year just closed the company has secured the largest output and transacted the heaviest volume of business in its history. Moreover, its capacity for handling future business has been substantially increased by the erection of new shop buildings, power plants, machinery, equipment, &c., principally at Schenectady, Dunkirk, Richmond and Montreal. To increase still further the capacity and efficiency of the plants there has again been created an extraordinary additions and betterment fund of $2,000,000.

"During the year, the outstanding bills payable, amounting to $3,300,000, have been paid off and in their stead the company has issued a series of short term gold coupon notes, aggregating $5,000,000, bearing interest at the rate of 5 per cent., and maturing annually in sums of $1,000,000 on October 1, from 1907 to 1911; thus providing an additional cash capital of $1,700,000, which was urgently needed, notwithstanding the large increase in working capital, which has accumulated since the formation of the company in 1901.

"In April, 1907, the structural steel department, established at Montreal, was sold to the Structural Steel Company, Limited. As a necessary feature of the agreement sale, the structural shop buildings and equipment at Montreal were leased to the new company for a term of two years, with an option for one additional year. The Montreal company will, therefore, devote its attention hereafter exclusively to the business of producing and selling locomotives, steam shovels and rotary snow plows, for all of which the rapid development of transportation and industrial enterprises in Canada offers a field of exceptional promise."

A conversion from steam to electric driving was made recently in the Droylsden cotton mills, at Fairfield, England, under the difficult necessity of keeping the mill in operation during the change. The mill is now driven by 24 motors aggregating over 1000 hp., and is also electrically lighted. The engine room of the generating plant formerly contained an old beam engine, installed in 1834 to drive the mill, and later converted into a pumping engine. In its place a 1000-kw. steam turbo-generator forms a striking contrast. The old engine weighed about 100 tons and ran at 23½ rev. per min., the new one weighs 20 tons and runs at 1500 rev. The old engine occupied 38,500 cu. ft., the new one only 24,000 cu. ft., or five-eighths as much.

The preparation of pure helium by filtering the gases from clevite through a wall of silica has been accomplished by two French chemists. Helium diffuses readily through a silica flask heated to high temperature, while other gases, with the exception of hydrogen, and to some extent carbon monoxide, do not penetrate, even at over 1000 degrees. These facts form the basis of this easy method of obtaining pure helium. Hydrogen and carbon monoxide may be easily eliminated, as water and carbon dioxide, respectively, by adding to the original mixture of gases before diffusion a sufficient proportion of oxygen.

Boron Steels.

Research by Dr. Guillet.

Dr. Guillet, the indefatigable French experimenter on alloy steels, has just published the results of a research on boron steels. His report is to be found in the *Journal* of the Iron and Steel Institute, No. 2, 1907. Systematic experiments had not previously been made on boron steels; indeed, an attempt by Professor Arnold to introduce boron into steel did not succeed.

The analyses of the author's steels are given in the subjoined table. For their production a ferroboron was used, containing 31.1 per cent. boron and 2.85 per cent. carbon:

Mark.	Car.	Boron.	Man.	Sil.	Sul.	Phos.
2 Bo. 0.2.....	0.18	0.215	0.07	0.23	0.012	0.023
2 Bo. 0.5.....	0.22	0.462	0.29	0.16	0.015	0.015
2 Bo. 0.8.....	0.21	0.844	0.60	0.79	0.014	0.013
2 Bo 1.5.....	0.28	1.514	0.60	0.64	0.005	0.018
5 Bo. 0.2.....	0.47	0.155	0.37	0.28	0.020	0.020
5 Bo. 0.5.....	0.59	0.406	0.29	0.29	0.016	0.023

An attempt was made to prepare steels with higher percentages of boron, but they would not forge.

Results with Normal Steels.

The microscopic investigation of the steels revealed nothing unusual when they were etched with picric acid. If, however, the sample is etched with sodium picrate, a constituent with an intense black coloration is brought out. This special constituent occurs in the ferrite. In the steels with higher carbon it is present in decidedly larger quantities than in the low carbon steels, which would appear to indicate that carbon plays an important part in its formation.

The following table gives the results of the mechanical tests on annealed steels:

Mark.	Car.	Boron.	Ult. stress.	Elastic limit.	Elongation.	Red. area.	Sh'k test.	Hardness. No.
2 Bo. 0.2...	0.18	0.215	84,000	45,248	34.5	57.5	3	110
2 Bo. 0.5...	0.22	0.462	88,704	45,248	27.0	55.0	3	105
2 Bo. 0.8...	0.21	0.844	134,624	66,752	14.0	26.8	3	161
2 Bo. 1.5...	0.28	1.514	115,808	70,560	5.5	4.5	2	200
5 Bo. 0.2...	0.47	0.155	114,240	77,280	17.0	27.3	2	145
5 Bo. 0.5...	0.59	0.406	120,960	87,360	18.0	22.8	3	159

The results show that boron increases the elastic limit and ultimate stress, and reduces the elongation and reduction of area. The brittleness of all the steels is remarkable, notwithstanding the fair degree of elongation.

Quenched Steel.

The first four steels were quenched at 850 degrees C. (1562 degrees F.), and the other two, with higher carbon, at 775 degrees C. (1427 degrees F.). After quenching, the first two steels only revealed the faintest traces of the special constituent. Examination of the other steels brought out that the higher the percentage of boron the less easily does this constituent dissolve. The mechanical tests showed a remarkably high ultimate stress and elastic limit, which must be due to the boron present. The results are given as follows:

Mark.	Car.	Boron.	Ult. stress.	Elastic limit.	Elongation.	Red. area.	Sh'k test.	Hardness.
2 Bo. 0.2...	0.18	0.215	153,440	127,680	7.5	36.5	6	366
2 Bo. 0.5...	0.22	0.462	330,400	224,000	6.5	30.6	6	311
2 Bo. 0.8...	0.21	0.844	392,000	291,200	4.0	10.6	6	470
2 Bo. 1.5...	0.28	1.514	268,800	268,800	1.0	...	3	447
5 Bo. 0.2...	0.47	0.155	....	Broke badly.	..	...	3	558
5 Bo. 0.5...	0.59	0.406	....	Broke badly.	..	...	1	652

The results with the first two steels are truly extraordinary, especially the first, which still had an elongation of 7 per cent. One of the most interesting facts is that after quenching the resistance to shock in the first three steels is double what it was before quenching. The reduction of brittleness is evidently due to the disappearance of the special constitutent. Furthermore, the quenched pieces with about 2 per cent. carbon are exceedingly easily worked; they can be cut with a saw, filed or machined. In this respect the steel is similar to vanadium steel, where there is no relation between the Brinell hardness number and the workability of the material. To sum up, it appears that the following somewhat anomalous conclusion is reached:

Boron steels can never have any commercial application in the raw state, but might prove useful after quenching. In this condition they possess high ultimate stress and a remarkable degree of elastic limit, and at the same time are no more brittle than other special steels actually used. It should be noticed that the most interesting results were those obtained with a steel containing 0.50 per cent. boron.

Those steels which have been examined consist of ferrite, pearlite, and a special constituent, which appears to be a boro-carbide of iron, the composition varying with the percentage of boron and carbon in the steel. Quenching exerts a varying influence on this constituent, depending on its composition. In steels with a low percentage of boron it may readily be made to disappear by quenching at 850 degrees C. (1562 degrees F.), whereas in steels containing 2 per cent. boron it does not disappear even when quenching is carried out at 1000 degrees C (1832 degrees F.). G. B. W.

Canadian Cement Production.

The manufacture of cement in Canada dates from the year 1891, when operations were begun in a very small way at Marlbank and Shallow Lake, both in the Province of Ontario. The first year's output was 2053 barrels, which is only a little more than the daily production of one of the modern plants. In 1892 the output was 20,247 barrels, and 31,924 barrels in 1893. The next 10 years in the cement industry of Canada witnessed an increase of 50 per cent. each year. Four plants were in operation in 1901, and now there are 19. In 1906 there were 15 plants in operation, with a total daily capacity of about 10,500 barrels, and according to the published figures of the Canadian Geological Survey, during the year 2,152,562 barrels of Canadian cement were made, which represents an increase of 610,994 barrels, or 39.6 per cent. over the production of 1905.

Very little cement is exported from Canada. The consumption is due to the use each year of better and more improved machinery and equipment. An excellent example of a cement plant whose equipment, when completely installed, will be among the best in Canada, is that of the Western Canada Cement & Coal Company, which some time ago purchased, through Allis-Chalmers-Bullock, Ltd., Montreal, three 1000-kw. steam turbine generator units for use on the company's properties, located 57 miles west of Calgary, Canada, on the Canadian Pacific Railway.

The new units, which are now being erected, will generate current of 60 cycles, three-phase, at 600 volts, and the coal to be used in their operation will be taken from the mines of the Canadian Pacific Railway and delivered at the mills. The current generated from the turbo-units will be entirely for power purposes; the lighting load, consisting of some 40 arc and 400 incandescent lamps, will be carried by the exciters, in addition to their work of exciting the turbo-alternators. Allis-Chalmers cement making machinery, comprising a No. 7½ K and No. 4 K Gates breaker and 16 tube mills, is also in use there.

An electrically driven dredge, the Thor, recently built in Germany, is 150 ft. long, has a speed of 7 miles an hour and dredges 220 cu. yd. per hour from a depth of 25 ft. Two boilers furnish steam to two 175-hp. engines, which may be connected to the propellers for driving the vessel, or to two large centrifugal pumps. A 220-hp. engine is direct connected to two dynamos, and a 25-hp. engine driving a lighting generator. A single condenser serves all four steam engines. The capstans, jib cranes and dredging machinery are all driven by electricity. The dredge is of the chain bucket type, driven by a 100-hp. motor, the speed of which is controlled by varying the voltage. The vessel is steered and the dredge operated under the control of one man in the pilot house.

The Central Foundry Company.

The eighth annual report of the Central Foundry Company, covering operations for the fiscal year ending June 30, 1907, enables the following comparisons of net earnings to be made:

	1907.	1906.
Net earnings after deducting operating and other charges	$467,171	$493,769
Repairs and renewals	$127,166 }	36,096
Replacements	17,778 }	
Bond interest	231,780	231,780
Balance	$90,447	$225,893

The general balance sheet, as of June 30, 1907, shows the financial condition of the company to compare as follows with the preceding year:

Assets.	1907.	1906.
Properties and equipment	$14,896,348	$14,962,482
Central Iron & Coal Company, capital stock	1,000,000	1,000,000
Central Radiator Company, capital stock	200,000	200,000
Bills and accounts receivable	650,506	574,505
Cash in banks and on hand	39,523	65,544
Deferred charges and accounts unadjusted	45,345	.....
Notes receivable, discounted (see contra)	40,583	.....
Inventories	1,100,057	639,846
Totals	$17,972,362	$17,442,377
Liabilities.		
Capital stock issued (total $14,000,000)	$13,300,000	$13,300,000
Debenture bonds	3,863,000	3,863,000
Bond interest accrued	38,630	38,630
Bills and accounts payable	562,989	240,747
Discounted notes receivable (see contra)	40,583	.....
Reserve for unearned profits on goods in warehouses	55,525	.....
Reserve for deferred charges and unadjusted accounts	49,996	.....
General reserve	61,639	.....
Totals	$17,972,362	$17,442,377

President August Hecksher states that the net earnings of the Central Iron & Coal Company and of the Central Radiator Company, whose stocks are owned by the Central Foundry Company, were $227,160, and continues: "During the year, owing to the high and fluctuating price of pig iron, more particularly from December to June, the earnings of the Central Iron & Coal Company have been large, and the earnings of the Central Foundry Company have been impaired correspondingly. This shows the wisdom of the management in establishing and equipping in the South a furnace plant of its own. Your company through its ownership of the Central Iron & Coal Company controls its own mines, coal properties and blast furnace, and is thus itself the producer of its principal raw material. The earnings of the combined companies show a healthy increase over the previous year. The amount of business done in the way of tonnage also shows an increase of from 5 to 15 per cent. It has been found difficult, if not impossible, in the past, after the meeting of the shareholders in August, to secure the attendance of a quorum of the directors for the prompt transaction of the business of the company. Your directors have, therefore, concluded to present for your action at the meeting on August 29 of the current year a resolution which contemplates the closing of the books of the company at the end of the calendar year instead of June 30, as heretofore, and in that connection it is also proposed that the next annual meeting of the shareholders shall take place in March, 1909, instead of August, 1908."

Work of the Special Investigating Committee.

The report also gives the result of the examination of the company's books for the period of four years by public accountants, under the direction of a Special Investigating Committee, appointed by the Executive Committee, as instructed at the last annual meeting of the stockholders. The facts as thus shown are in part as follows:

The property account was opened in July, 1899, in the amount of $15,943,700. Owing to the absence of detailed records the company's account did not show the cost of the various plants acquired at the time of the company's formation, and we are therefore obliged to accept the amount above stated as the actual cost of the properties at that time. The only additions to property account since July, 1899, is one item of $201.80 for land purchased at South Pittsburg, Tenn. The credit to the property account amounting to $302,642.15 consists principally of property sold, fire losses, melted equipment, and the par value of 137 debenture bonds, purchased at a price of approximately 94½ per cent. (the exact figures cannot be ascertained). The company has on its books a reserve account for depreciation of plants, which, at June 30, 1906, amounted to $1,109,344.16. This reserve has been accumulated from year to year by charges against operation and credits to the reserve account. The reserve account at June 30, 1906, applied against the property account, would show a balance in the latter account of $14,531,915.49. The following is a list of the foundries and their location: Baltimore, Md.; Newark, N. J.; Bessemer, Ala.; Anniston, Ala.; Vincennes, Ind.; South Pittsburg, Tenn.; Medina, N. Y.

The company has expended and charged to account of additions to properties to June 30, 1906, $418,647.43. These expenditures were mainly for new construction, improvements, equipment, machinery and working patterns.

The accounts receivable at June 30, 1906, amounted to $577,851.52, of which approximately $55,000 was considered doubtful and had been standing on the books for a considerable time. Against this possible loss of $55,000, however, the company's books show a reserve of $18,346.42.

The authorized issue of the capital stock of the company is $14,000,000, divided into $7,000,000 of 7 per cent. cumulative preferred stock, and $7,000,000 common stock. The company has still in its treasury $350,000 of each class of stock. No dividends have ever been declared or paid on either the preferred or common stock. The cumulative dividends on the preferred stock amount to about 50 per cent., or $3,325,000. As accrued dividends are not considered a liability of the company until earned and declared, the accrued dividends are not included in the liabilities on the balance sheet.

The authorized issue of debenture 6 per cent. bonds of May 1, 1919, was $4,000,000. On June 30, 1906, the company had outstanding $3,863,000 bonds, $137,000 having been purchased and canceled, as required by the sinking fund provisions. No bonds have been so purchased since May 1, 1900.

A condensed general balance sheet is given as of June 30, 1906, compared with July 1, 1902, which shows that the profit and loss surplus June 30, 1906, was $54,259.93. In the four years thus covered heavy charges were made for depreciation of plants and equipment, as above indicated.

Referring to the subsidiary companies the statement is made that the properties of the Central Iron & Coal Company embrace approximately 6350 acres of mineral lands, containing valuable deposits of brown and red ore, coal and limestone. It has taken several years to accumulate these properties and properly develop them, to arrange for railroad facilities and to construct and equip a modern furnace, but the time has arrived where the company is earning a profit upon the investment.

The Annual Meeting.

At the annual meeting of the stockholders, held August 29, the report was accepted and a resolution was adopted changing the by-laws to make the fiscal year end hereafter on December 31. The next fiscal period will, therefore, comprise 18 months and the next annual meeting will be held on the third Thursday in March, 1909. With the exception of James T. Boothroyd, David B. Carse and John Reid, the old Board of Directors was re-elected. The incoming board is as follows: S. Watts Bowker, Montclair, N. J.; Horace L. Hotchkiss, Rye, N. Y.; C. R. Schmidt, Baltimore, Md., and George F. Crane, Geo. D. Hallock, August Heckscher, George Leask, Wm. H. Remick, Chas. Smithers, F. A. Berthold, F. C. Furlew and E. L. Lueder, all of New York City.

THE IRON AGE

1855-1907.

New York, Thursday, September 5, 1907.

Entered at the New York Post Office, as Second Class Mail Matter.

DAVID WILLIAMS COMPANY, - - - - - PUBLISHER
14-16 PARK PLACE, NEW YORK

DAVID WILLIAMS, - - - - - PRESIDENT
CHARLES KIRCHHOFF, - - - - - VICE-PRESIDENT
RICHARD R. WILLIAMS, - - - - TREASURER
GEO. W. COPE, - - - - - SECRETARY

CHARLES KIRCHHOFF, } EDITORS.
GEO. W. COPE, } EDITORS.
A. I. FINDLEY, } EDITORS.
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.

The Lake Erie-Ohio River Ship Canal.

The vitality of the project for a ship canal between Lake Erie and the Ohio River, as a project, is not to be gainsaid. The Lake Erie & Ohio River Ship Canal Company, with its one federal and two State charters, has brought its surveys to the point at which details of construction work are being discussed, and naturally the promoters have been able to enlist plentiful sentimental support in localities along the proposed route. The ease with which a showing can be made from the enormous tonnage of coarse freight in and out of the steel making districts of western Pennsylvania and eastern Ohio has made very attractive the paper presentation of the possibilities of such a water connection with the lakes. The iron ore requirements of the furnaces in Pittsburgh and in the Mahoning and Shenango valleys have naturally been the chief basis of all the calculations intended to demonstrate the desirability of the canal; and only second in importance is the return coal traffic to Lake Erie from the coal tipples of the Pittsburgh District. The pig iron production of Allegheny County in the first half of this year was 2,851,098 gross tons; that of the Shenango Valley 1,054,302 tons, and that of the Mahoning Valley 1,097,426 tons—a total of 5,002,826 tons, or 37 per cent. of the total for the country. This means roundly, with the now lowered average iron content of lake ores, about 10,000,000 tons of ore, or for a year, 20,000,000 tons. Taking the coal tonnage of 1906 as a criterion, it is reckoned that over 9,000,000 tons a year now goes up the lakes from the mines counted as of the Pittsburgh District. Here is a magnificent tonnage, and the certain prospect of its increase puts beyond peradventure the question whether the district the canal will traverse affords sufficient business for profitable tolls.

The *Marine Review* gives the results of the latest computations of the canal promoters and a summary of these will be interesting: If begun this year the canal may be completed by 1913, when it is estimated the tonnage of ore, coal and coke in the districts reached will amount to 50,000,000 tons, of which the canal in its third year might be expected to handle 10,000,000 tons, increasing this to 15,000,000 tons in the fourth year. The cost of moving ore to Pittsburgh by the canal is figured at 1.73 mills per ton mile, while 1.44 mills is the corresponding rate for coal to Lake Erie. Calling the distance to important Pittsburgh District furnaces 150 miles, the above figures come to 26 cents for ore and 21½ cents for coke. At such a cost a profitable canal rate would be far below the present rail rate of $1.44 a ton for ore to Pittsburgh and 88 cents for coal to lake port. This rail rate on ore, it is to be said, absorbs the unloading and other dock charges at Lake Erie and the switching and labor charge at the furnace yard, and there is some deduction where ore is taken direct from vessel to furnace yard without going on the dock.

The financial and engineering features are summarized in the following data: The total cost will be $53,000,000. Six per cent. can be paid on the capital stock, it is computed, before the end of the fifth year, and by the tenth year gross tolls will be $12,000,000 and net earnings $8,000,000. Utilization of the Ohio River to the mouth of the Beaver River, 25 miles, is counted on; then of the Beaver River itself for 20 miles; then of the Shenango River for a 25-mile branch to New Castle and Sharon; from the head of Beaver River (the main canal) the lower portion of the Mahoning River for 30 miles; then 30 miles of summit length, including a lake 9 miles long; finally 13 miles to Lake Erie, a descent of 327 ft. with 18 locks. The total rise for the Beaver River and Mahoning River divisions is 177 ft., requiring 12 locks. For the approach to the summit three locks are allowed.

When the proposed canal was last discussed in these columns, nearly two years ago, a communication was printed from the canal company's officers, saying that nothing less than 3,000-ton cargoes was contemplated. The late article in which the data above are given has this to say on the question of transportation:

> Four methods of transportation are proposed—first, by lake steamers of 2000 tons maximum capacity, which would not break bulk between upper lake ports and Pittsburgh; second, in steamers of barge type of about 2000 tons capacity, receiving their cargo at Lake Erie ports; third, in boats of canal lake barge type of approximately 2200 tons capacity, in towed fleets from upper lake ports to Pittsburgh; fourth, in towed canal barge fleets of about 1200 tons capacity, receiving cargoes at Lake Erie ports. This fourth method is the one which is regarded by the projectors with greatest favor, as it will permit the distribution of single units at the furnaces and the collection of fleets from the coal tipples. Moreover, the new Government locks on the Monongahela River are arranged for fleets to be taken through at one lockage—namely, one tow boat and three barges of the size proposed by the projectors of the canal. Assuming that the tow boat also carries a cargo, the full capacity of the fleet would be 4600 tons, based on a maximum draft of 11 ft. It is estimated that the trip from Pittsburgh to Duluth can be made in 13½ days. During an average season about 16 round trips could be made, moving about 54,000 tons. The steamer would cost approximately $105,000 and the barge $60,000.

It is to be questioned if the promoters of the enterprise have really any better digested opinions on the transportation and economic features of their problem than were presented two years ago. The Ohio River to-day affords nothing better than a 9-ft. stage to the mouth of the Beaver River, yet the latest calculations for the canal are based on 11-ft. draft, as against 15-ft. two years ago.

It is to be considered that the tendency toward lower railroad freight rates has even been accentuated in the past two years; furthermore, that the enormous investments in the existing machinery of ore and coal handling and transportation are a guaranty that a canal, once built, would not be allowed to secure any such share of the ore and coal trade between the Pittsburgh District and Lake Erie as would be required to make good the sanguine earning estimates alluded to above. As to the size proposed for the canal boats under the method preferred by the canal promoters, of receiving cargoes at Lake Erie ports, it would appear that a step backward is involved in the amount of rehandling of ore that is contemplated, both in loading and unloading steamers and barges of such size. The present arrangements at blast furnaces, by which ore is unloaded, a car at a time, either by car dumpers or by dropping the ore into bins or troughs, are vastly more economical

than the proposed method of lifting it through the hatches of small canal craft. As to the operation of a canal like that proposed, with its 33 locks, and the time and manipulation required to get a steamer and three barges through each of these in a trip to and from Pittsburgh, more light might be shed on the question whether anything like the tonnage calculated on could be handled between Lake Erie and Pittsburgh in the season of navigation. Much needs to be supplied, moreover, concerning the solution of the engineering problems involved in getting 15,000,000 to 20,000,000 tons of ore a season into small boats at the Lake Erie terminus of the canal. The handling of bulk freight as now exemplified at the railroad docks at upper and lower lake ports is an evolution of years; indeed, the handling problem has been the great problem connected with the present mode of transportation. The canal projectors, if their scheme is to be worked out to a success, must recognize that their handling problems are of equal importance with those of navigation.

Conciliation in Great Britain.

A recent clash between employers and men in the Scotch shipbuilding trade grew out of a walkout of boilermakers at one shipyard, due to the giving of certain work to apprentices. The strike was a violation of an agreement made in 1901, in which the Boilermakers' and Iron and Steel Shipbuilders' Society bound itself not to interfere in matters pertaining to apprentices. That it may turn out to be an affair of more moment than appears on its face is indicated by the attitude of the Shipbuilders' Employers' Federation. The union, which is a powerful one, has been notified by the employers' organization that in view of the frequent walkouts similar to the one now at issue there will be no settlement of the trouble, even though the men be ordered back, unless provision is made that in the future all disputes that arise shall be discussed by representatives of the two organizations before extreme measures are taken on either side. What is contemplated by the employers is a preventive of hasty strikes and lockouts, like the famous arrangement embodied in the agreement between the Engineering Employers' Federation and the Amalgamated Society of Engineers, as printed in *The Iron Age* of May 23, 1907, page 1579. The union of the shipyard workmen, strong as it is, will scarcely find ground for quarreling with the employers' position, since it is in line with the later tendencies in Great Britain.

Such a proviso removes industrial disputes by so much from the category of warfare and gives a chance for the sober second thought that may lead to peaceable adjustment. Naturally its successful working calls for discipline on both sides. A difficulty met in practice has been that one break over on either side is apt to be the beginning of a series of reprisals that severely strain the entente. The New York agreements at one time operative between foundry and machine shop organizations of employers in the United States and the respective unions of molders and machinists provided similarly that disputes should be discussed, with the shop still in operation and the men at work, and that there should be no strikes and no lockouts until an effort had been made to get a settlement by the intervention of the respective organizations. If the American labor unions in the metal trades progress to the point reached by similar unions in Great Britain and give up the attempt to control the shop in respect to apprentices, output and working force, they might find a greater disposition on the part of employers to adopt a conciliatory attitude, rather than that of distrust and defense, which has seemingly grown more common in recent years.

Coke and Pig Iron Shortages.

A special committee of the New England Foundrymen's Association, appointed to investigate the matter of shortages in shipments of pig iron and coke, is soon to make a report which will include recommendations tending toward a solution of a vexing problem. Foundrymen, in their more careful systems of keeping track of raw materials, have learned that shipments frequently vary in weight from those billed to them. These discrepancies have been a source of considerable friction in which shippers, customers and transportation companies have become involved. It has been difficult to place the responsibility, shippers attributing the fault to railroad or steamship companies, while the latter place the blame upon the shippers.

The foundrymen's committee believes, as a result of its careful investigation of the subject, that the root of the evil is in the lack of a consistent system of weighing, and its remedy is that the commodities should be weighed by the transportation company at point of shipment, at point of delivery, and at such intermediate points as may be necessary where responsibility is divided between carriers, as in the case of the transfer of freight from a railroad to a steamship company, or to a company operating barges or sailing vessels. While the proposed system has been sketched out as it would affect iron and coke shipments only, it would apply equally well to other classes of bulky freights.

In investigating the question a radical difference is found in the methods of weighing coke and iron. The railroad itself weighs the coke at point of shipment, and it is billed on that basis, presumably. As to pig iron, the railroads accept the shippers' weights at point of shipment, and consequently the problem of determining responsibility becomes a more complicated one. The customer who finds a carload of iron several tons short has his claim shuttled back and forth between the transportation companies and the shipper. Each disclaims responsibility. The railroad, for example, maintains that the iron was delivered in the same amount as received, while the shipper asserts with equal positiveness that the shipment was made according to the bill rendered. There appears to be no way to effect an equitable adjustment of the claim.

The suggested system would do away with the possibility of such a mix up. The railroad would weigh the iron upon its receipt and it would be billed on that basis. If it should be transferred en route to another carrier the weighing would be repeated. The steamship company would weigh the iron upon its receipt and again at the dock upon delivery to the customer or to a railroad. If there should be shortage when it reached the customer it would not be a difficult matter to place the responsibility of loss where it belonged. Foundrymen do not split hairs in their complaints. A loss of less than 500 lb. is usually not noted, for instances of similar overweight average up total shipments for a year. But there are few cases where carloads are several tons overweight, and it is claimed that to find a carload a ton or so less than billed is a far from infrequent occurrence.

As to coke shipments, while theoretically there can be no discrepancies between the amount billed and the amount shipped, there are nevertheless frequent instances

of underweight. Loss in transit is one reason for this. Another is carelessness on the part of railroad employees who are intrusted with the task of weighing the cars. Claims against railroads for these discrepancies and for consequent rebates on freight are not uncommon.

The greatest trouble comes from shipments of Southern iron to Northern points. Water carriers are employed for the greater part of the distance, and it is claimed that their methods of stowing the iron in their ships are not careful. Shipments for a number of customers are stowed together, inadequately separated, and in loading and unloading the chance of giving one customer something belonging to another is greater than it should be. The weighing of each bill of freight upon receipt and upon delivery by the carrier would prove a check against this source of error. But the steamship companies are unwilling to adopt the system. In one instance a company declined the request of foundrymen of an important city to install scales for the purpose, even though the petitioners offered to bear the expense of the weighing apparatus. The same is true of owners of sailing vessels and barges which are also employed for the purpose.

One large consumer of iron and coke, located in a New England city where he is dependent upon rail deliveries for much of his raw materials, has put into operation, in the weighing of coke, a system somewhat similar to that suggested by the foundrymen's committee. The railroad weighs the coke received for him, and it is also weighed in his yard. The weight at point of shipment is known. The factor of the difference between his own scales and those of the railroad is a known quantity. Consequently, he has an actual basis for claim against the company when a car is short in weight. As a result he has found a falling off in the number of instances which require complaint.

The theory of the system is that if the transportation companies should be given the responsibility of weights they would see to it that losses in transportation would not occur. If careless employees should make mistakes in weighing cars they would be sharply disciplined. If thievery should occur in transit means would be taken to keep more careful guard of freights. Losses due to this cause are believed to amount to an important total. The difficulty will be in persuading the carriers to adopt a system that would increase their financial liabilities. Yet a determined campaign by shippers and their customers should have its effect in decreasing so important an element of trouble.

CORRESPONDENCE.

The Remedy for Carelessness.

To the Editor: President Roosevelt, according to his Provincetown speech, evidently does not intend to cease his agitation of a national employers' liability law, one whereby he would have the employer assume all responsibility and costs of negligent employees' carelessness. Should his views on this subject become law, it would work more against the true interests of employees and the advancement of safeguards to protect life and limb of the masses than is possible to any other agency. It is a move in the wrong direction to increase protection to life, limb and property, as much as if to put out a fire, one would give it a draft instead of water. It would seem as if prevention of accidents was to have no consideration and all that was required of the people was to determine who shall pay the costs.

Make laws whereby negligent employees could be imprisoned and fined for injurious acts of carelessness, and fully one half of all our present day accidents, which cost thousands of lives and injuries amounting to millions annually, would never occur. Are not such laws worthy of endorsement by employees as well as employers?

Fully three-fourths of the shop, street and railroad accidents causing loss of life and limb are due to carelessness on the part of some employee. Instead of measures being taken to educate, train and enforce carefulness in employees, almost every agency is in the other direction, and the employer has sufficient burden at the present day in trying to abait carelessness without the passing of laws which would virtually say to the employee: "Give no heed to care or watchfulness; you are freed of all responsibility, as, whomever your acts may maim or kill, your employer can be forced to pay indemnity at the hands of any that would care to prosecute." A door would be open whereby any employee having imagined grievances, ill-will or spite, could often ruin an employer, as by no other means he so could easily use. All he would have to do is to scheme some accident, and a lawyer could cause the employer to pay heavy damages.

Some may believe that liability insurance companies could financially safeguard employers against accidents. Pass such a law as advocated by our President, and it is very doubtful if companies could be found who would undertake the great risks they would have to assume. If any did, few employers could have much confidence in their meeting their obligations, no matter how high their rates, as all risks would be so wholly subject to litigation that few outside of a company could have faith that all was well with it, no matter how strong a showing might be made to enlist patronage.

The very fact that almost every accident could be made the subject for litigation or outside settlement (whereas only one of 10 or so is now possible of such proceedings), is sufficient to show the risks that employers and liability companies would have to take. It would cause business to be so much of a lottery or game of chance, having no basis for figuring costs, that it would debar all but the very wealthy from undertaking business ventures. The class of self made men that is chiefly responsible for the greatness of our country to-day would no more dare to undertake enterprise. In this way, our greatest boast, "A country for the working man to rise in," would be a thing of the past as far as going into a manufacturing business is concerned. No greater blow could be struck honest and ambitious labor, as where would be found the man with a limited capital of hard earned dollars that could face the chance of being ruined at the start by the carelessness of some of his employees?

Some will say, use the power of discharge to discipline men. When, as in the past three years, if an employer discharged a man, that could not be well spared, he had but to walk a few streets to obtain a dozen jobs, wherein does discharging avail any benefit in disciplining men or decrease the chief cause of accidents? When there are two jobs for one man, it is placing a very unjust load on an employer to hold him responsible for the carelessness of the many flippant, over smart and besotted men he is compelled to employ in order to fill his contracts.

The injury and losses from carelessness are not confined to employees in work-shops. Every citizen is almost hourly subjected to risks of life and limb. While writing this article, attention is called to the carelessness of a man leaving a lion's cage door open in Pittsburgh so that the escaping animal killed a woman. Not much over a month ago a motor man turned his back to his controller in Elyria, Ohio, and allowed his car to run into another, killing and injuring many. For this wholesale murder, or the killing and maiming of many without a moment's warning, there is no law that can hold the flippant, drinking, careless worker sufficiently responsible for his wreckage of lives and homes.

To think that the employer is to be held for the costs of all his employees' carelessness as an atonement for the world's worst evil will appear to thousands as one of the most impracticable and unjust measures that could be advocated by intelligent men. After all, it is chiefly experience that teaches correctly, and he who must directly handle men in the hazardous occupations

of life is the best judge of what is just in regard to employer's liability. THOMAS D. WEST.

SHARPSVILLE, PA., August 31, 1907.

Mesaba Labor Troubles Continue.

DULUTH, MINN., September 1, 1907.—Strike matters on the Mesaba remain in statu quo, with some breaking out of minor disturbances at Eveleth, where there have been slight conflicts between strikers and deputies. The shipments are up to expectations from open pit mines and the forces underground remain about as stated a week ago. The Western Federation of Miners is trying to deport men brought in as operatives and is succeeding to some extent. Those remaining are, on the other hand, fast becoming reasonably skilled in their work. Minnesota mine shipments for August should be in the neighborhood of 4,600,000 tons.

On all old ranges stock pile shipments have by this time pretty well cleaned out the stock decks, an earlier date than ever before, and now just at the time that the Mesaba is absorbing its customary number of ships the demand from old ranges is falling to normal again. At the Chapin mine all stocks are cleaned up, this being the first time in many years that the boards at this great mine have been swept bare. Chapin should come up to the 1,000,000-ton mark this year. Ashland is cleaned up and Norrie nearly so.

The Virginia District Shows Still More Ore.

In and about section 9-58-17, Virginia District of the Mesaba range, great changes have taken place recently in the knowledge of boundaries of ore deposits, and far more ore is now shown there in the properties of the Republic Iron & Steel Company and the Oliver Iron Mining Company than ever before. Great surface changes are taking place as well, especially in the Oliver properties, and there will soon be a through cut that will open the Missabe Mountain, Lone Jack, Ohio and Norman to the steam shovel on ore. In the northeastern quarter of the northwestern quarter of section 16 the Alberta mine is being opened; it is a small deposit of ore that may connect up with the Minnewas of the Oliver Company. Railroad tracks through sections 4 and 9 can be maintained only with the utmost care and difficulty, for they are continually sinking on account of development beneath them. In section 33, just north, exploration is commencing and the Higgins No. 2 and Onondaga, in section 4, are under extensive development.

The Syracuse mine, on Embarras Lake, in the northwest corner of 58-15, is having very serious trouble with water. Following a long series of difficulties of the same general nature, and coming after trouble at all the new mines along the lake in that district, it is rather discouraging. Several mines are being opened near Embarras, one with a circular concrete shaft, some with drop shafts and all with great obstacles to contend with, on account of the quicksands, imbedded boulders and heavy inrush of water all the time. Syracuse had its shaft 20 ft. in bed rock, when an inrush of water drowning out the pumps took place. Where this water is coming from is a question, as if it is from the lake and river forced through the rocks by the pressure behind, it is a matter of far more than momentary interest to the operators. This shaft is the third that has been attempted at the Syracuse, two others having been abandoned. The third was sunk by the Foundation Company of New York, to bed rock, and there turned over to the mining company, which has driven it 20 ft. to the present flow of water.

At the Bangor mine, close by, the Foundation Company will turn over to the operators of the mine the circular concrete shaft in a few days, having completed its work there.

Having been quite successful in sinking difficult shafts on the Mesaba, the Foundation Company is now to work on the Cascade range, where it will sink a shaft for the Cleveland Cliffs Company at its new Smith mine. The overburden here is very wet, and is a soft quicksand; the airlock principle will be used in sinking and a concrete shaft will be built.

Marquette and Menominee Developments.

Humboldt and Clarkson, old mining locations on the Marquette range, idle for many years, are taking on new life. The work of opening the Humboldt mine has been already referred to, and now options have been taken on the old Conrad mine, near Clarkson, and on the Bessie mine. Both are in the hands of pumpmen at this time and both will be carefully examined as soon as possible. The Conrad has an open pit from which some 1000 tons were shipped, and a shaft 150 ft. deep. Its lens was narrow and of high grade, and the property was never thoroughly explored. The formation is supposed to be an extension of that at the Champion mine.

Corrigan, McKinney & Co. have recently undertaken the development of six new properties in the Crystal Falls District, where they recouped their fortunes in the rise of the iron trade after 1893 by leases on the Crystal Falls and other properties. They are sinking a new shaft at their Tobin mine, which, though in operation for some years, is a new development; are putting in a new equipment at their Armenia, which is a recent mine; have just installed plants at the new Fairbanks and Kimball mines, and are putting a plant on the Baker.

The Loretto Iron Company is preparing to dig a new channel for the Michigamme River, so that any danger of its breaking into the mine workings will be avoided. This river broke into the Mansfield mine a number of years ago and drowned many men. Several mines are now dangerously close to it. D. E. W.

Shipbuilding in the Maritime Provinces of Canada.

TORONTO, August 31, 1907.—At the recent annual meeting of the Maritime Board of Trade, an organization made up of the leading local boards of trade in New Brunswick, Nova Scotia and Prince Edward Island, the following resolution was carried unanimously:

> That the Maritime Board of Trade hereby indorse and approve of the principle of bonus of steel shipbuilding as offering a new and profitable field for the utilization of our steel products and the employment of skilled labor, and more than all in the creation of a new mercantile marine, which was formerly a great source of wealth to the country;
>
> And further resolved, That the board urge the Government to pass necessary legislation at the next session of Parliament granting a bonus to steel shipbuilding within the Dominion."

This resolution was introduced by the representatives of the Halifax Board of Trade.

New Glasgow, N. S., which was the seat of a flourishing shipbuilding industry in the days of wooden vessels, is making a start in the building of steel vessels. In the Carmichael shipyard there, which had been practically idle for a quarter of a century, the frame of a steel three-masted schooner is being erected, the first craft of that material to be built in the Maritime Provinces. The schooner is not a large one, but nearly all the materials to be used in its construction will be produced in Nova Scotia. The angles and other structural forms are furnished by the Nova Scotia Steel & Coal Company, the rivets and the rope are manufactured at Dartmouth, the canvas at Yarmouth, and the wood, with the exception of the masts, is taken from Nova Scotian forests.

It is computed that the customs duty on articles entering into the composition of a steel steamer aggregate about $6 a ton on the weight of the vessel. Hence, the bonus specified in all petitions that have been submitted to the Government for aid to shipbuilding is $6 per ton, this being regarded as no more than a drawback of duty. In some of the proceedings of the Maritime Board of Trade particular interest was taken by Dr. Pugsley, Attorney-General of New Brunswick, who has since been admitted to the Dominion Government, where he succeeded Mr. Emmerson as Minister of Railways and Canals. His influence, it is expected, will be exerted in behalf of the bonus proposition.

Practical use of air as an electrical insulator is made in a method patented by Prof. H. J. Ryan. The conductors have ordinary minor insulation and are inclosed in a compartment containing air sufficiently compressed to afford the requisite dielectric strength. It is estimated that at 588 lb. per square inch air should be as good as linseed oil bond paper; at 265 lb. as good as micanite cloth, and at 118 lb. as good as melted paraffin.

Steel for Concrete Reinforcement*.

Some Tests of Cold Twisted Bars.

BY JESSE J. SHUMAN.

After several years' experience with the manufacture of cold-twisted steel bars for concrete reinforcement the writer feels that there is not enough definite information on the subect. These notes are published in the hope that they may help engineers to write "safe and sane" specifications to govern the quality of an important material of construction. They may also be of value to those who are called upon to decide on the relative merits of the numerous styles of concrete bars.

Table I.—Experiments with ½-in. Twisted Squares, Showing the Effect of Increasing Number of Twists.

Grade.	No. of Turns per Foot.	Yield-point. Lbs. per sq. in.			Ultimate strength. Lbs. per sq. in.			Elongation in 8 in. Per cent.		Reduction of area. Per cent.		Elastic Ratio.	
		Plain.	Twisted.	Increase. Per cent.	Plain.	Twisted.	Increase. Per cent.	Plain.	Twisted.	Plain.	Twisted.	Plain.	Twisted.
Soft Bess.	3	41600	65600	57.7	60400	83200	37 7	28.25	10.0	64.0	49.6	68.9	78.8
"	4¼	39200	72400	84.7	60000	89600	49 3	28.75	5.75	63.4	31.2	65.3	80.8
"	5	41600	84800	103.8	60800	92000	51.3	30.5	6.25	65.8	36.0	68.4	92.2
"	5¾	40800	84000	105.9	60400	90000	49.0	30.0	7 5	64.6	40.0	67.6	93.3
"	5⅞	40000	8080c	102.0	60800	88800	46 0	27.5	3.75	60.9	25.2	65.8	91.0
Bess. 25 Carb.	3	48800	83600	71.3	74000	96000	29.7	25.0	8 0	53.8	48.9	65.9	87.1
"	4½	51200	83200	62.5	75200	99200	31.9	25.0	4.5	51.0	46.7	68.1	83.9
"	4⅞	52800	88800	68.2	75200	104000	38.3	24 0	4 0	54.4	44.5	70.2	85.4
"	5	51200	84200	64.4	75600	102000	34.9	22.5	5 75	50.3	44.5	67.7	82.6
"	5½	53200	84200	58.3	75200	100800	34.0	23.0	6.0	51.0	28.6	70.7	83.5
Soft O.H.	3	31200	46000	47.4	46400	64000	37.9	33.0	8.0	74.0	70.8	67.2	71.9
"	5	31200	60800	94.9	47200	68000	44.1	32.5	5.75	68.7	59.0	66.1	89.4
"	7	31200	68800	120.5	46000	76000	65.2	37.5	6.75	73.0	67.0	67.8	90.5
"	9	31200	67200	115.4	47200	71200	50.8	34.0	5.0	74.5	28.6	66.1	94.4

NOTE.—Bars of each grade twisted off when given more turns than here shown. The "elastic ratio" is the ratio between yield point and ultimate strength.

Effect of Size.

When a bar is twisted by a machine of the usual type it does not change in length. In fact one end is inserted loosely in the revolving die, and there is no tendency to pull out. Hence the central fiber alone is unchanged in length and strength, and the great increase in the strength of the bar is an average of values that are widely different. Moreover, the size of the square has a direct bearing on this average—a point that is commonly neglected in specifications.

If square bars of any size be twisted until they have made one complete turn in nine times the dimension of a side (pitch equal nine), the metal on the corners is stretched about 11.5 per cent. as determined by formulas for helices. The areas of squares, however, vary with the squares of their sides, so that in a small bar the average stretch is greater than in a large bar, and the increase in strength is correspondingly greater. This is amply illustrated by laboratory results in any series of tests in which the size varies, and it should be recognized as a normal manifestation.

Number of Turns.

The moment the twisting machine has created a permanent set in the fiber, the steel has begun to increase in strength, in the same manner as higher yield point and ultimate strength are set up in a bar when it is slightly stretched in a testing machine. As the twisting proceeds the yield point ascends more rapidly than the ultimate strength. There is a point, however, at which the maxi-

Table II.—Tests on Plain and Cold Twisted Steel Bars, Soft Bessemer Steel.—Number of Turns, Ordinary.

Size Inches.	No. of Turns per Foot.	Yield-point. Lbs. per sq. in.			Ultimate Strength. Lbs. per sq. in.			Elongation in 8 in. Per cent.		Reduction of area. Per cent.		Elastic Ratio.	
		Plain.	Twisted.	Increase. Per cent.	Plain.	Twisted.	Increase. Per cent.	Plain.	Twisted.	Plain.	Twisted.	Plain.	Twisted.
½x½	4	36800	80000	117.4	65600	92800	41.5	19.5	8.0	64.0	53.8	56.1	86.2
"	4	38400	78400	104.2	68800	91200	32.5	17 5	7.5	64.0	56.5	55.8	86.0
⅝x⅝	3½	39130	71160	81.8	61180	85380	39.5	26.0	10.0	67.8	55.5	63.9	83.3
"	3½	39830	72560	82.2	62330	85380	37.7	28.0	12.0	62.4	60.8	63.9	85.0
½x½	3	41600	65600	57.7	60400	83200	37.7	28.25	10.0	64 0	49.6	68.9	78.8
"	3	38600	66000	71.0	63100	91200	44.5	27.75	10.0	61.7	48.1	61.2	72.4
⅝x⅝	2½	40020	73860	84.5	63100	85560	35.6	26 0	9.5	63.8	55.6	63.4	86.3
"	2½	40940	74180	81.2	64640	84960	31.5	28 0	11.0	61.2	56.7	63.3	87.3
¾x¾	1½	40340	74680	85.1	60450	80860	33.8	30.0	13.5	64.0	55.5	66.7	92.4
"	1½	39120	72720	85.9	60080	81060	34 9	31.0	14.0	62.4	58.1	65.1	89.6
⅞x⅞	1¼	39380	71340	81.2	59460	77960	31.1	34.0	13.75	59.2	58.5	66.2	91.5
"	1¼	39640	68700	73.3	59200	75980	28.3	34.0	10.0	61.1	56.3	67.0	90.4
1x1	1	36000	66000	83.3	61000	73900	24.4	32.0	6.5	59.6	43.0	59.0	89.3
"	1	37400	67500	80.5	61000	74000	21.3	33.0	9.0	56.7	53.1	61.3	91.2
1⅛x1⅛	⅞	37550	61640	64.1	58820	70680	20.2	30.0	12.5	60.1	49.3	63.8	87.2
"	⅞	38330	63100	64.6	58820	70580	20.0	31.0	12.5	56.6	50.6	65.0	89.4
1¼x1¼	¾	39530	61100	54.5	61420	78950	28.5	30.0	12.0	47.5	36.0	64.3	77.4
"	¾	38251	62510	63.4	61300	79270	29.3	30.0	6.0	45.2	31.5	62.3	78.8

* A paper read at the Atlantic City meeting (1907) of the American Society for Testing Materials. Mr. Shuman is chief inspector of the testing department of the Jones & Laughlin Steel Company, Pittsburgh, Pa.

mum strength of the bar is reached, and beyond which it is reduced somewhat before the bar twists apart.

The interesting behavior of ½-in. squares of three widely different grades is shown in Table I. It would clearly be a mistake to specify a number of turns approaching the maximum strength of the steel, for the internal strains in such a bar are already nearly enough to destroy it; yet it is not uncommon for engineers to do this very thing. In the writer's opinion the number of turns should be about half the number at which the steel is at its maximum strength; and in the ordinary soft Bessemer product this means one complete twist in 8 to 10 times the size of the bar. In other words, the pitch of the twist should be 8 to 10 for Bessemer steel of about 60,000-lb. tensile strength. Basic open hearth squares of similar grade should have a pitch of 5 to 7, in order to have their best properties developed. If carbons higher than ordinary structural grades are insisted upon, a proportionate concession must be made in the number of twists.

Quality.

Excellent results have been obtained with both Bessemer and open hearth steels of a wide range of carbons. It seems reasonable, however, that the grades that have been found to be best adapted to structural work would also be most reliable for reinforced concrete. Bessemer steel containing carbons up to 0.30 or 0.40 per cent. can be twisted successfully, and are very high in tensile properties, but they have the same brittleness that constitutes the strongest argument against the various hot rolled and hot twisted concrete bars. The latter must be high in carbon in order to yield an elastic limit that even approaches that of the soft steel cold twisted square rods. Surely the lowest yield point in Table II, in which are shown results on soft Bessemer bars, is high enough to suit the most exacting requirements.

On low phosphorus steel the effect of twisting is not as marked as on Bessemer steel, the behavior in this respect being quite similar to that of the same steel when cold rolled or cold drawn. The lower results are readily raised, however, by carrying the twisting process further. Table III shows what can be expected of basic open hearth bars of 55,000 to 65,000 lb. tensile strength twisted an appropriate number of turns.

Manifestly it would be a poor plan to use open hearth steel softer than the tests shown in this table, but it would be both safe and advantageous to use steel up to about 0.35 per cent. carbon, with phosphorus under 0.04 per cent.

Elastic Limit.

Inasmuch as the function of a reinforcing bar is performed inside the elastic limit, the elastic limit is the feature of highest importance from the engineer's standpoint. It is here that the cold twisted square excels all hot finished sections and must always continue to do so, for its elastic limit of 60,000, 70,000 and even 80,000 lb. permits the use of less steel for the same service than can be guaranteed by its competitors.

In the testing laboratory it is necessary to take unusual pains to observe the yield point, commonly called elastic limit, for the reason that the beam of the machine does not always drop when the point is reached at which permanent deformation begins. The machine should be run not faster than ⅝ in. per minute, and in the absence of an autographic device a pair of dividers should be held on the specimen until the yield point is observed.

Specifications for Twisted Bars.

Specifications for cold twisted bars should be consistent with the behavior of steel of known quality, and should recognize the empirical laws peculiar to the material. Thus, to summarize and add to points made in this paper, the following suggestions are offered as a broad foundation for specifications:

1. Process.—Specify whether open hearth or Bessemer steel is to be used or either. Open hearth steel should contain less than 0.04 per cent. phosphorus for basic and 0.06 per cent. for acid steel.

2. Carbon.—This should usually be left to the discretion of the manufacturer, who insists that when carbon limits are named the tensile requirements should be left open.

3. Elastic Limit.—For squares ½ in. and smaller, this should be at least 65,000 lb.; for squares ⅝ in. to 1 in., at least 60,000 lb., and for squares 1⅛ in. and larger, at least 55,000 lb. Manufacturers can generally guarantee minima values somewhat higher than these, but the above would be a reasonable specification.

4. Ultimate Strength.—To be recorded.

5. Elongation.—At least 5 per cent. in 8 in., or 12 per cent. in 2 in.

6. Reduction of Area.—To be recorded.

7. Bend.—Bars to bend cold around a pin twice their size without distress.

8. Number of Turns.—For Bessemer steel, one complete turn in 8 to 10 times the size of the square; for open hearth steel, in 5 to 7 times the size.

9. Number of Test Pieces.—One tension test specimen and one for bending test for each melt used in each size.

10. Inspection.—All tests governing the acceptance of material to be made at manufacturer's works. Inspector to have access to the bars prior to shipment, but the manufacturer is not relieved thereby from responsibility for unsatisfactory material. In this connection it may be stated that each bar is thoroughly cleaned by the twisting process, and that each piece is in a large measure tested at the same time, as no imperfect bar will stand the cold twisting process.

Table III.—Tests on Plain and Cold Twisted Steel Bars, Open Hearth, of 55,000 to 65,000 Lb. Tensile Strength.—Number of Turns, Special.

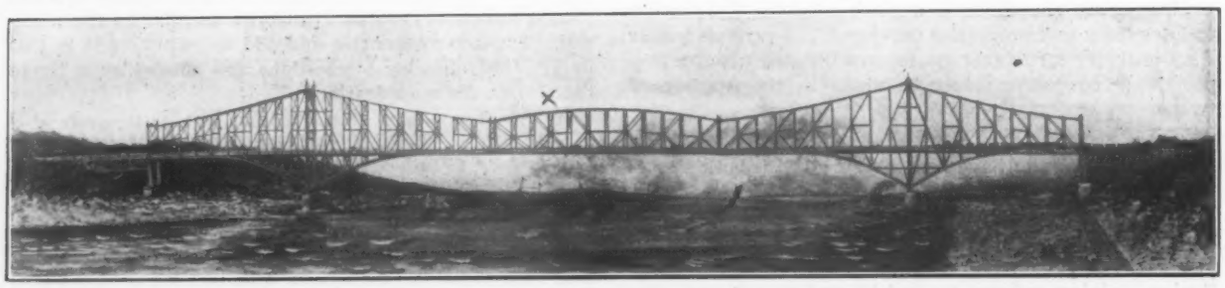
Size. Inches.	No. of Turns per Foot.	Yield-point. Lbs. per sq. in.			Ultimate Strength. Lbs. per sq. in.			Elongation in 8 in. Per cent.		Reduction of area. Per cent.		Elastic Ratio.	
		Plain.	Twisted.	Increase. Per cent.	Plain.	Twisted.	Increase. Per cent.	Plain.	Twisted.	Plain.	Twisted.	Plain.	Twisted.
½x½	5	38000	58000	52.6	61200	92000	50.3	27.25	5.25	64.0	11.6	62.1	63.0
"	5	37600	60000	59.6	60400	91200	51.0	28.75	5.25	65.2	31.5	62.2	65.8
⅝x⅝	3½	34130	60000	75.8	58660	75450	28.6	27.5	6.25	62.5	55.2	58.2	79.5
"	3½	34880	58480	67.7	58220	76060	30.6	31.25	8.0	61.1	53.7	59.9	76.9
¾x¾	2½	31170	52800	69.4	57020	69670	22.2	31.0	7.5	61.2	46.5	54.7	75.8
"	2½	34370	55770	62.3	57050	69300	21.5	28.75	7.5	59.7	44.8	60.3	80.5
⅞x⅞	2	35660	65960	85.0	60740	78110	28.6	30.0	6.5	60.5	27.6	58.7	84.4
"	2	35000	60870	73.9	59430	71580	20.4	29.0	8.25	50.3	45.7	58.9	85.0
1x1	1¾	33120	57920	74.9	57430	67480	17.5	31.0	9.0	52.5	43.1	57.7	85.8
"	1¾	33360	54350	62.9	59060	72300	22.4	30.75	6.0	54.0	26.8	56.5	75.2
1⅛x1⅛	1½	38560	66140	71.5	68760	82560	21.5	32.5	7.75	49.3	14.8	56.0	80.1
"	1½	32350	57290	77.1	56150	72570	29.2	32.25	5.25	60.7	14.6	57.6	78.9
1¼x1¼	1½	33740	62230	84.4	55550	68890	24.0	30.0	7.75	46.7	30.7	60.7	90.3
"	1½	32950	57140	73.4	55810	73340	31.4	32.0	6.25	52.0	24.6	59.0	77.9

Wm. B. Melish on September 3 was appointed by Judge Warner to be receiver of the Steel Foundry Company, Cincinnati, which has been idle some time. Sumner W. Hume, the original appointee, goes to Chicago. The stockholders and directors are working on a plan which promises to bring about a resumption of operations.

THE QUEBEC BRIDGE COLLAPSE.

The Greatest Engineering Accident Ever Known.

The Quebec bridge, which collapsed August 29, causing the death of some 80 engineers and workmen, is designed to span the St. Lawrence River 5 miles below the city of Quebec. As planned, it is to be the longest single span cantilever bridge in the world, the length of the center span being 1800 ft., or 200 ft. longer than that of the Firth bridge, which is at present the world's longest single bridge span. The Blackwell's Island bridge, now being built over the East River, is to have one cantilever span of 1182 ft. and another of 984 ft. The total length of the Quebec bridge between abutments is to be 3220 ft., consisting of two approach spans, each 210 ft. long; two anchor arms, each 500 ft. long; two cantilever arms, each 562½ ft. long, and one suspended span in the center of the bridge, 675 ft. long. To allow the free passage of vessels it is to have a clear headway over high tide of 150 ft. for a width of 1200 ft. The total weight of the steel in the bridge is 38,500 tons. The weight of the heaviest single piece is 100 tons and the length of the longest single section is 105 ft. The eyebars are the largest yet used, with a maximum number of 56 on one pin. The diameter of the pins are 9 to 24 in., and their length is up to 10 ft. The bridge is 2800 ft. long between centers of anchorages and will have a total width of 82 ft., including the cantilever sidewalks. It is designed to carry two railroad tracks, two highways, two electric car tracks and two foot walks on a single deck about 200 ft. high above extreme low water.



The Quebec Bridge as It Will Appear When Completed.—Starting from the Left, the Bridge Had Been Built to the Panel Marked with a Cross When the Collapse Occurred August 29.

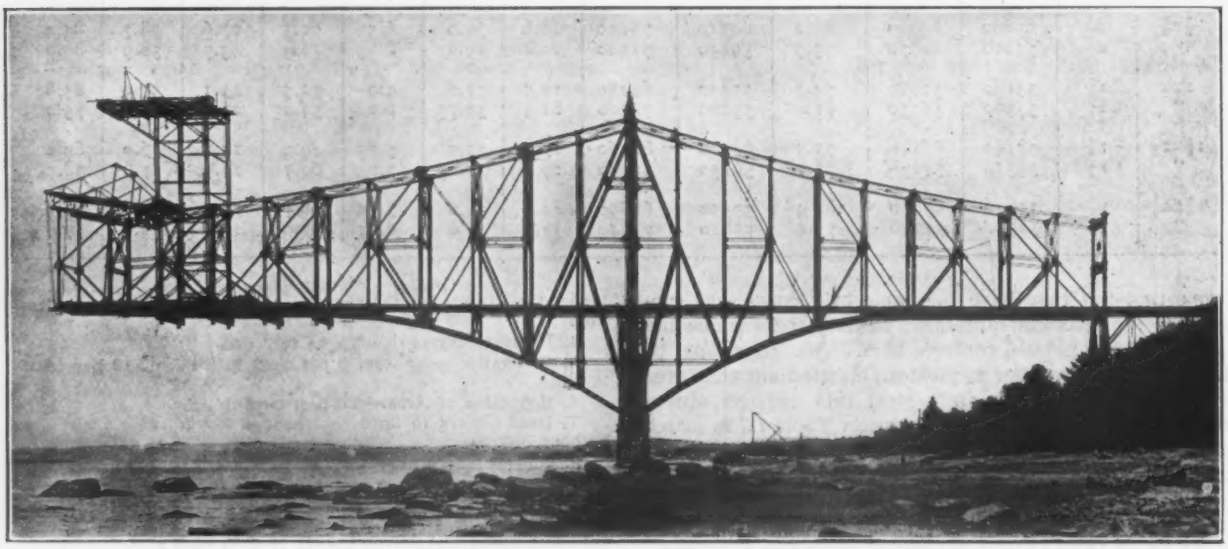
The steel work was designed and fabricated by the Phœnix Bridge Company, Phœnixville, Pa., and it is being erected by the same company. Theodore Cooper, New York, is consulting engineer. Through the courtesy of the Phœnix Bridge Comapny, Theodore Cooper and the *Engineering News*, we are enabled to present the accompanying illustrations of the bridge, the first coming from the Phœnix Bridge Company, the next three from Mr. Cooper and the others from the *Engineering News*.

The *Bulletin* of the American Iron & Steel Association, speaking of the great bridge building company whose reputation and credit are involved in this serious catastrophe, says: "There will necessarily be delay in the resumption of work in the erection of the bridge, but it will be completed on the original plans and by the Phœnix Bridge Company, whose financial ability is unshaken by this calamity, which could have been guarded against by no human foresight."

Report by H. M. Mackay.

The following report has been specially prepared for *The Iron Age* by H. M. Mackay, associate professor of civil engineering, McGill University, Montreal, who inspected the wreck:

The total collapse of the steel superstructure of the Quebec bridge is undoubtedly one of the most astonishing disasters that has ever occurred in connection with any undertaking of the kind. This structure was expected to be the finest of its kind in the world. The design and workmanship were, so far as yet apparent, of a high order. Every care was taken to secure the best grade of material obtainable. Erection methods were carefully thought out and attracted much attention among bridge engineers. And yet, on a fine summer afternoon, without any unfavorable climatic conditions or any unusual condition of loading, the entire superstructure fell without warning and became a complete wreck.



The Quebec Bridge as Completed Up to July 22.—Two Panels More Had Been Added Up to August 29.

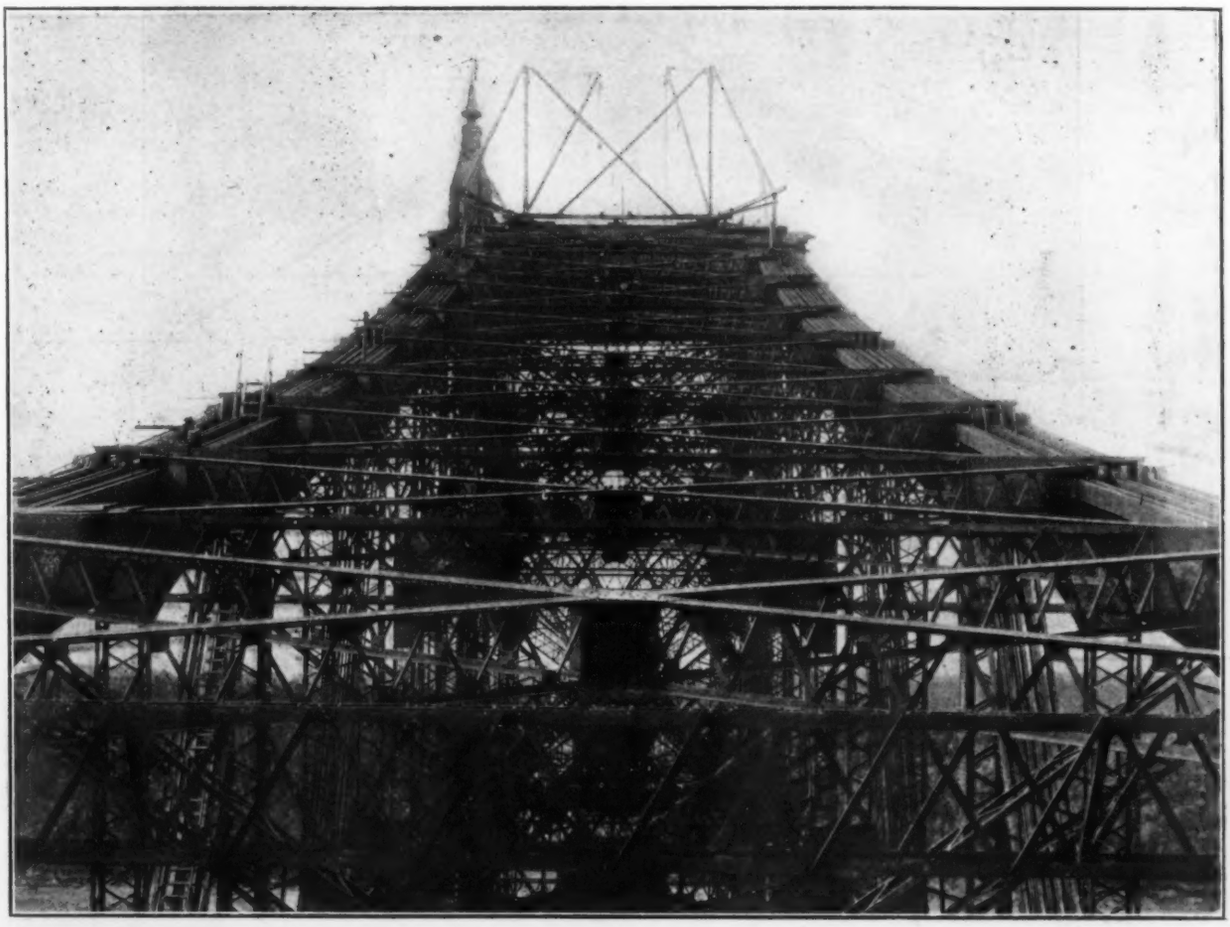
The erection of the southern portion of the suspended span was being carried on by means of a traveling crane, and had proceeded to about the fourth panel from the south end of the suspended span, or within two panels of the center of the structure. A train consisting of two

cars loaded with chord sections, and a locomotive, was being pushed out to the end of the erected portion when the accident took place. The train load does not appear to have been an unusually heavy one. Little information, throwing light on the causes of the accident, can be gathered from eye witnesses. The experience of the timekeeper, however, was interesting. He was at a point about 250 ft. from the anchorage when he felt a tremor which caused him to turn and run toward the shore. He succeeded in covering the distance and reaching the approach span before the anchor arm collapsed. It was therefore probably 12 or 15 seconds, and perhaps more, from the time of the first yielding until the gap between the approach span and the anchor span became too wide to cross. As the approach span rests on independent supports, it was not affected by the fall of the main portion of the structure.

The piers are of concrete, faced with granite, and an examination of the wreck shows them to remain in practically perfect condition. The edges of the granite coping are slightly broken, where heavy members fell across them, but the damage is altogether insignificant. The eyebars, constituting the anchorage, were inclosed above the masonry in two tapering, pillar like steel shells. As the latter tumbled over they bent the ends of the eyebars projecting out of the masonry to the extent of a few inches. Otherwise the anchorage was in perfect condition. This indicated beyond a doubt that the failure was in the superstructure of the bridge.

The cantilever arm and the erected portion of the suspended span fell into deep water, and are completely submerged so that the anchor arm is the only portion still visible. The metal here seems to have fallen almost vertically from the position which it occupied in the bridge, although at some points there was a slight motion down stream. Looking at the wreck from above, the top chord eye bars are easily traced. The writer was unable to detect any sign of failure whatsoever in these or any other eye bars in the accessible portion of the wreck. Several bottom chord splices have failed, sometimes by tearing the splice plates and sometimes by shearing the rivets. Many of the main posts are bent back upon themselves to an angle of 180 degrees. They are built channel sections made up of from four to eight webs and four heavy angles. In several places the rivets fastening the web plates together and those connecting the angles to the webs were shorn off for a distance of 10 to 20 ft., measured along the axes of the posts.

The lower ends of the main tower posts were apparently kicked back off their pedestals toward the anchor pier, and the posts themselves are buckled and festooned over the river pier. On the down stream side, what was originally the top of the post, is turned up on the channel side of the pier, so as to be visible above water. The position in which these posts have fallen gives some probability to the supposition that the original failure took place in the anchor arm and the somewhat gradual collapse, as well as the alleged absence of loud reports, suggests the failure of a compression rather than of a tension member as the starting point. It is exceedingly difficult, however, in the inextricably tangled mass of steel to separate cause from effect.



The Quebec Bridge, Looking from the South Portal, Top Strut.—The View Shows One Ornamental Spire Erected on Center Posts. The Figure of a Workman Can Be Seen on This Spire.

It seems very improbable, however, that the disaster was due to any defect in the material employed. The satisfactory way in which the metal stood its severe punishment is a matter of general remark. Angles are broken off short here and there on account, probably, of the suddenness of the shock they sustained. But at another point the same angles are frequently seen doubled back sharply upon themselves without any trace of a flaw. Some of the rivets show quite ideal fractures, and, as noted above, the eye bars are generally and, perhaps, without exception, intact.

The workmanship, too, so far as is now apparent, seems excellent. Some press reports have suggested that failure may have been due to carelessness of removing bolts in field riveted joints. It is to be remembered, however, that field riveted joints, as far as the main trusses

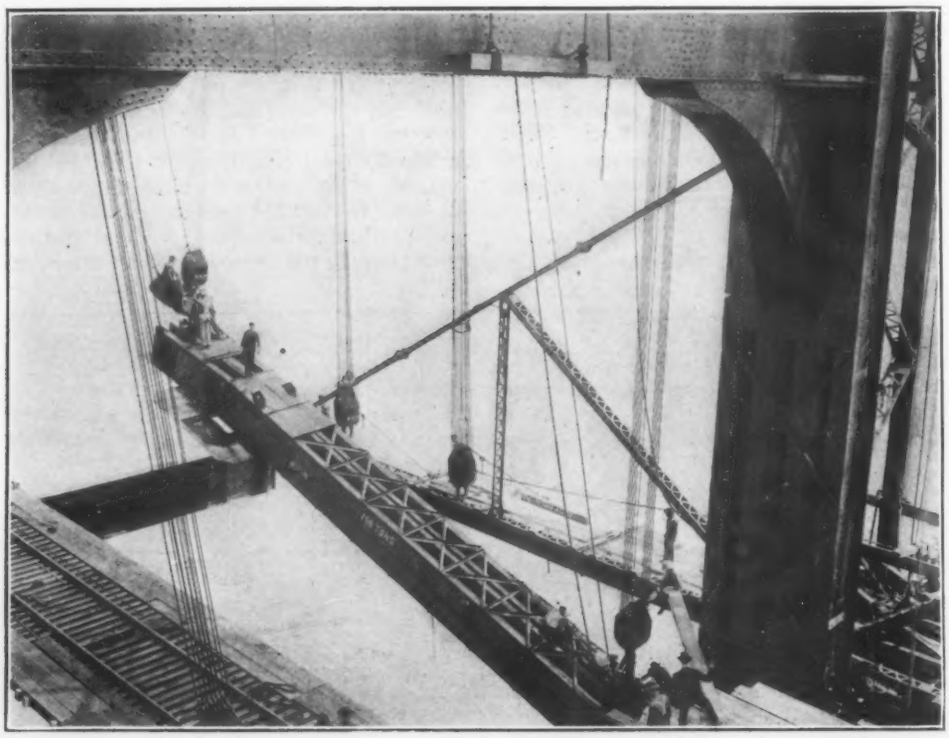
are concerned, occur only in compression members, and that considerable latitude might be indulged in, in such cases, without imperiling the stability of the structure.

As to the general design and the structural details, it is impossible in the time available and with the data at hand to reach a final opinion. But almost any explanation would be more probable than that so serious an error could be made as to cause the failure of a member or detail under a load, presumably, of but a moderate fraction of its ultimate strength.

Where, then, is the cause of failure? The writer feels himself quite unable to suggest any probable explanation. Further investigation may, of course, discover a clue. A Government commission has been appointed, consisting of Henry Holgate, consulting engineer, of Montreal, and Professors J. G. G. Kerry and J. T. Galbraith of Toronto, to make a thorough investigation of the cause of the disaster. The commission is working in entire harmony with the engineers of the bridge. With the assistance of the latter, the various members are being numbered as they lie, in order that they may be traced from their position in the bridge to their present location, in the hope that some light may thus be thrown upon the subject.

It is to be hoped that the commission may be able to arrive at a definite conclusion, as there will be much public alarm so long as the mystery remains unsolved. In addition to this, there will be much uneasiness in the minds of structural engineers who reflect that such a disaster should be possible in a branch of engineering which they have been accustomed to regard as an exact science.

One line of reflection suggests itself. Many of the members, and particularly of the compression members, in the bridge, were of quite an unprecedented size. In the present state of our knowledge there must be some doubt as to whether the experience gained from



The Quebec Bridge.—Lowering the First Piece of Steel for the South Cantilever Arm, the Heaviest Piece on the Bridge.

The Quebec Bridge After the Collapse.—Looking Toward the Abutment.

ordinary members in ordinary structures is fully applicable to those of much larger dimensions. In examining the wreck, the writer was struck with the lightness of the lattice angles on some of the huge chords and posts. Absolutely these bars were large, but relatively they seemed almost insignificant. Could any engineer undertake to say, with absolute certainty, that they were sufficient? Perhaps in this, or in some similar respect, the designers may have gone beyond the present bounds of engineering knowledge. Whatever the cause of the failure, a close study of the results cannot fail to be instructive and profitable to any bridge engineer.

The Great Northern Ore Mines.

DULUTH, MINN., September 1, 1907.—There is a revival of talk over the Great Northern ore deal, now that a dividend has been paid on the ore certificates, and some very incorrect information is being printed. It is said that the royalties paid on independent mines owned in fee by the Great Northern and leased to independent concerns will this year be $3,000,000. This is almost one cipher too high. There are three of these mines owned in full by the Great Northern and one-half of another. The three are Mahoning, Stevenson and Kinney, and the gross royalties they will pay this year will be in the neighborhood of $300,000.

Mahoning and Stevenson will produce a little more than 2,000,000 tons and Kinney about 135,000 tons. Royalties on the three range from 12½ to 16 cents a ton, which latter is the figure for the Kinney. The Great Northern owns a half interest in the fee of the Leetonia, the other half being held by Cavour Langdon and G. H. Warren of Minneapolis. This mine will produce this year about 250 000 tons and will pay 36 cents a ton, or $45,000 to the Great Northern.

It is also said that the United States Steel Corporation is to pay this year $750,000 on its royalty account, as agreed for the first year. The writer does not understand that the Steel Corporation pays anything this year, for the ore deal is of too recent occurrence to have any royalties accrue thereon. It is true that the Great Northern announced the deal and issued its ore certificates based on the transaction a year or so ago, but the Steel Corporation had not finally taken the properties over at a very recent date. There may be considerable sums of money in the way of back royalties on the Mahoning, Stevenson and Kinney, accumulated during past years, that may be distributed to ore certificate holders, in which case the dividends will be large for some time from this source.

It is also again stated that the Great Northern ore lands contain 500,000,000 tons of iron ore; but this statement has been so thoroughly commented on in THE IRON AGE that it is unnecessary to revert to it again. If the ore deal has, at last, been finally completed, the Oliver Iron Mining Company will doubtless soon get to work on some of these lands preparatory to mining, but no active step to this end has yet been undertaken.

There should be during 1908 payments by the various operators on Great Northern lands of something less than $1,100,000; how much less will be determined by two factors. First is the proportion of ore to be taken by the Steel Corporation, under the Great Northern agreement, from lands owned in fee by the latter, and how much from lands on which the road has to pay underlying royalties to other fee owners. As a matter of fact, on the greater part of these Great Northern lands the road must pay royalties to various fee owners before it can receive any part of the royalty it is to be paid by the corporation. Second, is the grade of ore mined; if it comes up to the standard set in the agreement it will pay the full royalty, but if below that standard it will be mulcted for every 1 per cent. of iron less, and it is a fairly conservative estimate to figure 15 to 20 cents a ton off the stated rate on the average ton of ore mined from these lands.

D. E. W.

Woven Wire for Concrete Reinforcement.

The American Steel & Wire Company has issued the "Engineers' Handbook of Concrete Reinforcement," a volume of 118 pages, 6 x 9 in., bound in flexible cloth. It contains much general data on reinforced concrete, with several chapters from standard works on the manufacture and properties of concrete, particularly from "Concrete; Plain and Reinforced," by Taylor and Thompson. Considerable space is given to the illustration and description of the American Steel & Wire Company's two types of steel wire reinforcement—triangular and square mesh. The triangular mesh is built up of either stranded or solid longitudinal or tension members with the cross or bond wires transversing diagonally the width of the fabric. In the square mesh type the longitudinal members are solid wires evenly spaced, with the bond wires running at right angles. Tables are given showing the weight per square foot, number, sizes, spacings and areas of wires and longitudinal strands; also tables and diagrams giving moments for the usual thickness of slabs. By the aid of these a suitable wire fabric used with or without bars may be selected for the various forms of construction in which reinforced concrete is employed. The tables of strength are based on a working stress of 16,000 lb. per square inch, which is about one-quarter the strength of ordinary mild steel wire. Illustrations are shown of a number of buildings and other structures in which the triangular mesh reinforcement is employed. This is considered particularly desirable for constructions subjected to great variations in temperature. The continuous longitudinals which take the main portion of the load can be made of any desired capacity. Emphasis is laid on the advantage of the triangular reinforcement in that to break the concrete so reinforced the diagonal wires must be sheared or pulled apart. They thus add to the strength of the reinforcement.

The Quebec Bridge After the Collapse.—Looking Toward the River.

PERSONAL.

Walter G. Stephan, formerly with the Wellman-Seaver-Morgan Company, Cleveland, has opened a mechanical engineering office in the Citizens' Building, in that city. He will make a specialty of power plants.

W. T. Clark, for the past seven years assistant mechanical superintendent of the General Electric Company, Schenectady, N. Y., has resigned that position to become general superintendent of the Fairbanks-Morse Mfg. Company, Beloit, Wis., assuming his new duties September 1.

C. M. Hallman, for the past six years secretary of the American Iron & Steel Mfg. Company, Lebanon, Pa., has resigned his position for the purpose of entering the Board of Directors and becoming associated with the management of the Kentucky Refining Company, manufacturer of cotton seed oil, Louisville, Ky. The vacancy caused by the resignation of Mr. Hallman will be filled at an early date.

J. Gilmour, Bennett Building, New York City, has been appointed Eastern representative of the Piqua Blower Company, Piqua, Ohio.

Among those who will come up for election to membership at the Vienna meeting of the Iron and Steel Institute are: Augustus Bainbridge of the Newport News Shipbuilding Company; H. M. Boylston of Cambridge, Mass.; H. C. Cridland of Dayton, Ohio; J. H. Gray of the United States Steel Corporation; Stewart McCulloch Marshall of Johnstown, Pa.; Charles F. Rand, president of the Spanish-American Iron Company, and J. E. Sweet of El Paso, Texas.

William T. Gummey, of Gummey, McFarland & Co., tin plate and metal merchants, Philadelphia, Pa., returned August 30 from a three months' trip abroad.

J. B. Ayres, formerly superintendent of the National Rolling Mills of the National Tube Company, McKeesport, Pa., has resigned and has been succeeded by H. N. Pendleton, formerly superintendent of the Republic Iron Works, also owned by the National Company.

The Kemmerer Iron & Steel Company, Scranton, Pa., has elected Henry Spruks president, Philip Robinson treasurer, and Arja Williams secretary and acting manager.

J. P. Johnston has resigned his position as sales manager of the Water Tube Boiler Department of the Atlas Engine Works, Indianapolis. His new address is at the Engineers' Club, New York.

F. W. Bowler, who has been connected with the W. M. Pattison Supply Company, has been appointed sales manager of the Modern Machinery & Engineering Company, 309 Schofield Building, Cleveland, Ohio, succeeding Thomas Ahern.

John L. Klindworth, for several years chief draftsman of the steel works department of the Jones & Laughlin Steel Company, has resigned to take charge, on September 16, of the rolling mill engineering department of the Mesta Machine Company, Pittsburgh.

Franklin E. Snow, treasurer and general manager of the Wells Bro. Company, Greenfield, Mass., manufacturer of tops, dies and screw plates, has sailed from England for home on the Ivernia.

G. B. Waterhouse of the Lackawanna Steel Company, Buffalo, N. Y., sails for Europe to-day to attend the meeting of the Iron and Steel Institute at Vienna.

The Union Horse Shoe Company, Providence, R. I., has purchased the plant of the Mount Hope Iron Works, Somerset, Mass., and states that it will begin at once the work of rehabilitating the property preparatory to equipping it for the manufacture of horse shoes. The works have been idle for several years, during which time various announcements of its purchase for manufacturing purposes have been made.

The floating drydock, however useful, is not a satisfactory substitute for the masonry or basin drydock. General repair work cannot be conducted nearly so economically and heavy weights are very difficult to handle. The shallow water in the vicinity of most naval stations requires mooring a large dock so far from the station as to make its use impracticable for anything but painting and cleaning bottoms and minor repair work.

OBITUARY.

HENRY CONNARD, Reading, Pa., died August 26 from paralysis, aged 76 years. He had been a member of the firm of Douglass & Connard, machinists' supplies, for half a century.

PRESPEY PERAULT, founder and owner of the Perault Foundry, Worcester, Mass., died suddenly September 1, aged 70 years. He was a native of Canada, but had lived since boyhood in the United States. After learning his trade he became foreman of the Smith & Page foundry, Fitchburg, Mass., and in 1869 established the business which he conducted up to his death. He was a member of a famous family of foundrymen. He himself used the abbreviated form, Pero, in his name, but most of the family, including a number of brothers in the foundry trade, maintain the French spelling.

JOHN M. STOWELL, Milwaukee, Wis., died August 30, aged 85 years. He had been a prominent citizen of Milwaukee for many years, and had served the city at one time as its mayor. He was born in Alexander, Genessee county, N. Y., and spent his early years on a farm, completing his education at Marietta College, Ohio. When a young man he became interested in the foundry business and established machine shops at several places in the West. His first enterprise of this character in Milwaukee was in 1856 and was begun on borrowed capital of $1,000. At that time he leased the old Menominee Works at the corner of Reed and South Water streets and began the manufacture of circular saws. Several years later he formed a partnership with D. L. Filer and from that grew the Cream City Iron Works of Filer, Stowell & Co., which has grown to such large proportions. He retired from business a number of years ago. He is survived by his wife and one daughter, the wife of Charles E. Sammond, who is vice-president and treasurer of the Stowell Mfg. & Foundry Company, Milwaukee, which was named after Mr. Stowell.

HENRY TROTH TOWNSEND, well known in iron and steel circles, died September 1 at his residence at Bryn Mawr, Pa., after a long illness, aged 56 years. He was a son of the late Edward J. Townsend, and had for many years been connected in various official capacities with the Logan Iron & Steel Company, Lewistown, Pa., serving for a long time as president. He was also prominently connected with the Southwark Foundry & Machine Company, of Philadelphia, but has been out of active business for several years. He is survived by a widow, one son and three daughters.

E. J. HUMPHREYS, owner and one of the founders of the Millbury Machine Company, Millbury, Mass., died August 22, aged 69 years. He was a native of Chicopee, Mass., and during the Civil War went to Millbury, where he filled a contract for the manufacture of guns for the United States Government. He was for years postmaster of Millbury.

Both mills of the American Tube & Stamping Company, Bridgeport, Conn., were reopened August 19, after being closed for a month because of a strike for an increase in wages, in which over 2000 men, mostly Hungarians, were involved. The men voted to return to work, although their demands for higher wages had not been granted. The company has, however, agreed to refer disagreements to a board of arbitration, consisting of three merchants.

At Pittsburgh, in the suit of the Pittsburgh Steel Foundry against the Pittsburgh Steel Company, the court has handed down an opinion declaring that $23,096.49 is due the plaintiff.

NEWS OF THE WORKS.

Iron and Steel.

The Pennsylvania Engineering Works, New Castle, Pa., builder of blast furnace construction and heavy plate work, is building a new blast furnace for the Hamilton Iron & Steel Company at Hamilton, Ohio. The company recently shipped two 20-ton converters to the Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

The new galvanizing plant recently erected by the Sharon Steel Hoop Company at Sharon, Pa., has been completed and was put in operation last week. The plant has a daily capacity for galvanizing about 15 tons of hoops and bands.

The Bellefonte Furnace Company, Emporium, Pa., which blew out its furnace July 23 for relining and repairs, expected to blow it in again September 3.

The mills of the American Tube & Stamping Company, Bridgeport, Conn., were reopened August 19, after having been closed for a month because of a strike for wage increases by the company's employees. It is stated that the strike is over, the men having voted to return to work. The company has not granted the demands of the men, but has agreed to refer disagreements to a board of arbitration consisting of three merchants. Over 2000 men were involved in the strike.

The No. 3 Eliza blast furnace of the Jones & Laughlin Steel Company's upper works was blown in on August 31, after an idleness of 24 days, during which time it was relined and some new connections were erected between the dust catcher and the centrifugal dust separator. The furnace made over 1,023,000 tons of iron on the previous lining. The company is erecting 10 rectangular ovens 36 x 5 ft. at its upper coke oven plant, which it expects to have in operation in the latter part of September.

The Quinn Furnace Company, Gadsden, Ala., is installing a new blowing engine and boilers in its charcoal iron furnace to increase the output.

The two plants of the United Sheet & Tin Plate Company at Marietta and Newcomerstown, Ohio, were sold at receiver's sale on August 27 to parties representing Philadelphia people. Whether the plants will be put in operation is not known at this time.

The Canonsburg Steel & Iron Works, Canonsburg, Pa., manufacturer of fine steel and iron sheets for stamping, is making some additions to its plant and adding new equipment. A new steel building, 75 x 200 ft., is being added to replace a wooden structure and will contain the cold rolling department. It is equipped with a 25-ton traveling crane. An addition is being built to the warehouse and also to the storage house for storing sheet bars. The plant is running to full capacity in all departments.

General Machinery.

The Sprague Electric Company, New York, has received an order for 10 type S, 12-ton mono rail cranes, 150 automatic track switches, 1½ miles of track, supporting structure, installation, &c. This is said to be the largest single contract for this class of machinery ever awarded.

The Advanced Radiator Company, Cedar Falls, Iowa, of which T. Holland is president, is in the market for a 75-hp. engine, feed water heaters, shafting, belting, pulleys, three lathes, 20 and 30-in.; single drill press and other appliances to equip a foundry.

The Pennsylvania Railroad is building a machine shop, 110 x 147 ft., in Chicago, Ill.

H. W. Coffin has been appointed receiver for the Bartlett-Tewksbury Machine Company, Birmingham, Ala.

The East Broad Top Railroad Company has let contracts for new machinery for its car and engine repair shops at Orbisonia, Huntingdon County, Pa.

The Great Falls Iron Works, Great Falls, Mont., contemplates the erection of a new machine shop, 63 x 80 ft., this fall. The company intends to equip the shop with modern machinery, and when it is complete it will about double the present machine shop capacity.

The Sandusky Foundry & Machine Company, Sandusky, Ohio, has just completed a triplex pump with a capacity of 3,000,000 gal. per day for the Terre Haute Paper Company, Terre Haute, Ind., and has orders on hand for six other large pumps to be built for paper companies, four for the International Company, to be installed at Niagara Falls, and two for a Canadian company.

The plant of the Bair & Gazzam Company, Twenty-ninth and Liberty streets, Pittsburgh, comprising a four-story brick machine shop and power building, fully equipped with machinery, will be offered at receiver's sale on September 25, at 11 a.m. Geo. M. Bole is receiver, from whom full advices regarding the plant may be obtained.

The H. K. Porter Company, Pittsburgh, is installing an air haulage plant for the Orient Coal & Coke Company, Orient, Pa., consisting of three locomotives, a pipe line, compressor and complete equipment. It is also installing a compressed air plant for the Republic Iron & Steel Company at Republic, Pa.

The George A. Hogg Iron & Steel Foundry Company is seeking a site of about 6 acres, near Pittsburgh, to which it will remove and enlarge its present works. The company manufactures rolling mill machinery and rolls, and has outgrown its present quarters at Twenty-fourth street and the Allegheny Valley Railway, Pittsburgh.

The new plant of the Westinghouse Electric & Mfg. Company, erected as an addition to the machine shop in East Pittsburgh, will be started about September 15. It is 70 x 400 ft., eight stories high, and was built at a cost of $500,000. The building will be used for the details and supply department for the manufacture of switches, coils, small motors, &c. Work on the building was begun last April.

Power Plant Equipment.

The Peerless Motor Company, Inc., Lansing, Mich., manufacturer of power and electric lighting gas and gasoline engines, has made a contract with the Hercules Gas Engine Works, Alameda, Cal., by which it will manufacture for the latter its entire product of gas engines for a period of 10 years, the minimum amount of business to be furnished during that time being $1,000,000. The Hercules Gas Egine Works made this contract with the Peerless Motor Company on account of the present unsatisfactory condition of the labor and metal markets on the Pacific Coast. The Peerless Motor Company will at once enlarge its capacity at least 100 per cent., and will need considerable new equipment.

The Port Clinton Electric Light & Power Company, Port Clinton, Ohio, has let contracts for two 150-hp. boilers, 300-hp. engine and a 200-kw. generator, in order to largely increase the present capacity of its plant.

Walter G. Kirkpatrick, engineer, Jackson, Miss., will receive bids until September 13 for three 30-in. turbine dynamos, induction motors, centrifugal or duplex pumps and other equipment for a hydro-electric water works and light plant for Lawrenceburg, Tenn.

McKesson & Robbins, New York, have commissioned Dodge & Day, engineers and constructors, Philadelphia, to make additions to their present power plant. These will include a new engine, generator and necessary changes in the piping, wiring, &c. Dodge & Day made a report on power requirements for this firm some time ago and the present work is the result of that report.

The Eagle Boiler Works, Riter & Cousins, proprietors, Buffalo, N. Y., which makes a specialty of marine work, has completed and is occupying its new plant at Washington and Perry streets. The main building is 53 x 125 ft.

The Central Mfg. & Heating Company, Little Rock, Ark., has been incorporated with a capital stock of $200,000, to operate the plant of the Little Rock Heating Company. It is also stated that the company contemplates the erection of an ice plant of a 100-ton capacity, but at the present time no definite arrangements have been made regarding this extension of the business or other plant changes.

The Board of Water Commissioners of Los Angeles, Cal., will receive bids until September 30 for two 300-hp. water tube boilers and one 7,000,000-gal. cross compound pumping engine.

The Sioux City Boiler & Sheet Iron Works, Sioux City, Ia., is to establish a plant for boiler work and repairs. The machinery has been purchased. The company is owned by Robert Wildman, Robert Wildman, Jr., and George Wildman, who operated a boiler plant in Toledo.

Foundries.

The Hardwick-Webb Machine Company, Dallas, Tex., has purchased the Dallas Foundry Company, increased its capital stock from $20,000 to $40,000, and changed the name to the Hardwick Foundry & Machine Company. The company is building a new foundry, 80 x 140 ft., to be equipped with a 60-in. cupola and a 10-ton electric traveling crane, and a pattern shop, 50 x 100 ft. It manufactures railroad frogs, switches and special street railway equipment, structural iron and machinery castings.

The Vincennes Pipe & Casting Company, Vincennes, Ind. maker of soil pipe and fittings, Murphy boilers and general castings, has completed and is now operating its new plant recently under construction. Only one cupola was installed at the time of building, and the company is now carrying out its original plans by increasing its molding shop from 50 x 200 ft., to 150 x 200 ft., and installing a larger cupola and blower. Equipment for these enlargements has already been purchased.

The Hempfield Foundry, Greensburg, Pa., founder and machinist, which has been in successful operation since 1898, has incorporated with a capital stock of $45,000. The business will be carried on under the same management as heretofore. The directors are Harry C. Burkett, J. R. Eisman, J. Howard Patton, L. B. Huff and Richard Coulter, Jr.

A. J. Detloff, Detroit, Mich., has purchased for about $20,000 the building and property at 120-129 Champlain street, which he will use for the manufacture of fine gray iron castings, novelties, wood, and metal patterns and motors.

The Keystone Steel Casting Company, Chester, Pa., states

that owing to the increased volume of business coming in it has decided to increase the capacity of the plant. Contracts have already been let for the erection of two additional crucible steel furnaces and for one annealing furnace.

Charles Baldwin, trustee of the Vulcan Foundry & Machine Company, New Castle, Pa., has been instructed to sell the plant at trustee's sale.

The Pittsburgh Foundry & Machine Company, now operating a small plant at Thirty-first street and Liberty avenue, Pittsburgh, has started work on a new and larger foundry at Salem, Ohio. For some time the company has had a small plant under lease at Salem, but owing to the expiration of the lease the company was compelled to seek new quarters. A building 96 x 100 ft. will be built and most of the equipment of the old plant will be installed. The melting capacity will be about 15 tons daily.

The Sterritt-Thomas Foundry Company has just completed the erection of a three-story building, 48 x 72 ft., on Smallman street, Pittsburgh, to be used as a pattern storage house. The company's plant, which was destroyed by fire on May 13, is now being rebuilt. Contract for a steel building 45 x 183 ft., with two lean-tos, each 20 x 183 ft., has been let to the Pittsburgh Bridge & Iron Works, Rochester, Pa., and one section is nearly completed. Two 15-ton electric cranes will be installed. One of the 58-in. cupolas formerly used will be put in service, and a new 72-in. cupola will be added, both of which will have a daily capacity of between 30 and 35 tons, and other necessary foundry equipment will follow.

Bridges and Buildings.

The Shepherd Engineering Company, to engage in general erection and other work, has been granted a Pennsylvania charter with $300,000 capital stock. It will have its works at Williamsport. H. D. Brown and other prominent local capitalists being interested.

The Cowing Engineering Company, which is erecting a structural iron fabricating plant in Cleveland, Ohio, has increased its capital stock from $100,000 to $1,250,000, of which $500,000 is to be 7 per cent. preferred.

The McClintic-Marshall Construction Company has asked the Council of Pottstown, Pa., for the vacation of a street for the purpose of making extensions to its plant.

Preliminary steps have been taken by the city of Milwaukee for a bond issue for the purpose of completing the viaduct across the Menominee Valley. The structure is being built in three sections and when completed will extend a total length of 2750 ft. The contract for the first section was let last winter to the Stroebel Steel Construction Company, Chicago. It has practically completed its contract for that section at a cost to the city of about $100,000. The viaduct, when completed, will be one of the most important undertakings in bridge construction ever done by the city of Milwaukee. It will be 60 ft. wide, with a roadway 40 ft. in width and sidewalks 10 ft. wide on each side. The roadway at the highest point will be 80 ft. above the bed of the Menominee River. Over the railroad tracks there is a span 135 ft. in length. The viaduct will be paved with brick on a foundation of concrete, and 9 tons of steel rails are being laid by the city, which will then lease them to local traction companies desiring to operate lines over the viaduct. As soon as the necessary funds have been provided for, bids will be called for the second and third sections.

W. N. Kratzer & Co., 3218-3230 Smallman street, Pittsburgh, are furnishing the steel work for a new six-story building, 110 x 120 ft., being erected for the Pittsburgh Mercantile Company on Carson street, Southside, this concern being a subsidiary interest of the Jones & Laughlin Steel Company. About 925 tons of steel will be required for the new building, which is being furnished by the Jones & Laughlin Company. The firm has also commenced work on some steel derricks and cranes, intended for South America, on which shipment will be made next month. In addition to this it has contracts on its books for steel work for a court house, two cement plants and a large steel building for shipment to Southern California, as well as the steel for a brewery to be located in eastern Pennsylvania. It has also recently completed shipment on a large contract for steel work for a mining company in Utah, besides various other contracts for material in different places.

The Pittsburgh Construction Company, Diamond Bank Building, Pittsburgh, has just completed the erection of a 230-ft. single leaf Scherzer rolling lift bridge for the Baltimore & Ohio Railroad at Cleveland, for its line to Whiskey Island. It is also completing the erection of another bridge of the same type with a 160-ft. arm of double track construction across the Cuyahoga River at Cleveland for the Nickel Plate Railroad. During the past three years the Pittsburgh Construction Company has been re-erecting the entire Cuyahoga viaduct, and this 160-ft. span completes the whole structure, which is 3000 ft. long. About 5000 tons of structural steel were used in the work.

Fires.

Fire destroyed the machine shop of the Hanson Furniture Company, Union City, Pa., August 31. The loss, $15,000, is covered by insurance.

The plant of the Waterville Foundry & Mfg. Company, Waterville, N. Y., was burned October 29, the loss being about $10,000.

The Terrell Foundry & Machine Company's plant at Terrell, Tex., was burned August 24. The loss is placed at $15,000.

The power plant and concentrating mill of the Highland Milling Company, Highland, Wis., were destroyed by fire August 29. The loss is placed at $15,000.

The paper mill owned by Elmer Hultz, at Lancaster, Pa., was damaged $15,000 by fire August 24.

No. 2 ore washer of the Etna Iron & Steel Company, Etna, Ga., was burned August 23.

The plant of the Standard Milling Company, at Houston, Texas, was destroyed by fire September 3, the loss being about $500,000.

Hardware.

The Rex Light & Stove Company, Milwaukee, Wis., manufacturer of gasoline lighting systems and stoves, has been incorporaetd with a capital stock of $5000. The incorporators are W. J. Rack, R. W. Lovesy and William Tures.

The New Castle Forge & Bolt Company, New Castle, Pa., has found it necessary on account of the large volume of business on its books to install several more bolt machines and otherwise increase the capacity of its bolt and rivet departments. The company also has in contemplation the erection of a steel building, 72 x 80 ft., to serve as a warehouse.

A Pennsylvania charter has been granted to the Standard Casket Hardware Company, Tionesta, Forest County, Pa. The men interested are Homer N. Young, Pittsburgh; W. W. Gillen and F. A. Ortserfer, Youngstown, Ohio; A. P. Gillen and A. H. Kelly, Tionesta.

The American Wire Cloth Company was incorporated August 26, with office at 414-415 Prudential Building, Newark, N. J. John Campbell, Jr., is president. The company takes over the business of J. Campbell, Jr., formerly conducted by him at 226 Verona avenue, Newark.

The Boston Woven Hose & Rubber Company, Cambridge, Mass., has several buildings under construction, among which is a brass foundry. This building is 100 x 175 ft. and is of brick construction, with monitor roof. Ample facilities are provided for the storage of metal and finished castings, and when finished it will be especially complete for the production of brass hose couplings, nozzles and similar work. It will be one of the largest foundries in the country for making brass castings exclusively, and will enable the company satisfactorily to handle its rapidly increasing business on garden hose, steam, air drill and fire department couplings, spray nozzles, fire pipes, sprinklers and other hose accessories.

Miscellaneous.

The Allegheny Cornice & Skylight Company is erecting on Boquet street, Allegheny, Pa., directly across from its present plant a two-story building, 100 x 140 ft., to be used as a cutting and forming department. It will have iron clad rock facing and when completed will present an unique and ornamental appearance. Machinery consisting of a 13-ft. squaring shear and a 13-ft. press, to be used for heavy work, and a 10-ft. press with other equipment, is now being built to be installed in the new building. The offices will be located on the second floor of the new structure, while the present space used for offices will be used as an extension to the old shop. When the new building is completed another, 75 x 100 ft., will be erected to serve as a warehouse. This company has recently furnished 1000 metal sash and frame windows, and also iron doors for a new building for the Westinghouse Electric & Mfg. Company at East Pittsburgh, and has also similarly equipped the new building of the Pittsburgh Gage & Supply Company in Pittsburgh.

The Taylor-Wilson Mfg. Company, McKees Rocks, Pa., is building 27-in. and 36-in. Fischer reversing valves for the National Tube Company for its Pennsylvania and Lorain works.

The new plant of the Petroleum Iron Works Company, Sharon, Pa., manufacturer of tanks and iron and steel plate work, is about completed and will be put in operation in a short time.

The Calkins Stove Mfg. Company, Columbus, Ohio, which was incorporated some time ago, with a capital stock of $100,000, is negotiating for a site of 3 1-3 acres, upon which it proposes to erect a large stove factory. The company is now operating a plant under the name of W. R. Calkins & Co.

A. J. Vollrath has sold out his interest in the Jacob J. Vollrath Mfg. Company, Sheboygan, Wis., resigning the presidency, and with his two sons, Carl J. J. and Walter J. J., has organized the Vollrath Company, which has broken ground for a new plant to be erected in Sheboygan. The site covers 1000 blocks and has a railroad frontage of 3500 ft. The main building will be 60 x 300 ft., two stories high, and will be devoted to the manufacture of porcelain enameled plumbing supplies. It is expected that part of the plant will be ready for operation within 90 days.

The Atlas Specialty Company, 76-78 Tracy street, Buffalo,

N. Y., manufacturer of emery grinders, Simplex metal cutters and mast arms for arc electric lights, has developed a large export trade with England for its foot power emery grinders and Simplex metal cutters.

The Buffalo Smelting Works will add to its large copper smelting plant at the foot of Austin street, Buffalo, N. Y., an electrolytic refinery, which will modernize the methods of handling some of its products and increase its output. The new building will be a large one-story brick structure with a frontage on the Erie Canal, and will be equipped with a large amount of costly machinery.

The Hunt Boiler Works, Marinette, Wis., has under construction a Raymond log loader. It is to be built entirely of steel, and it is expected to prove an even greater success than the loaders constructed of wood and iron. The company is expecting a big demand for the steel loader and may manufacture them in large numbers.

In an item published in these columns in the issue of August 22 it was erroneously stated that McLeod Brothers, makers of automatic scales and packaging machines, had removed their business from Peru, Ind., to Davenport, Ill. In accordance with the facts it should have been stated that the firm had removed from Peru, Ill., to Bloomington, Ill., where it is now manufacturing automatic scales and packaging machines.

The Universal Railway Equipment Company, Jackson, Mich., has been organized to manufacture and market grain doors of a new design for freight cars. The company's capital stock of $100,000 is represented in the values of patents held on this device. The stockholders of the company are S. F. Randolph, New York; E. B. Gilleland, Topeka, Kans., and H. E. Edwards, Jackson, Mich.

The Pekin Implement Mfg. Company, Pekin, Ill., recently organized with a paid up capital of $25,000, will occupy the old Pekin plow shop property and expects to commence operations as soon as repairs on buildings and machinery are completed. The officers of the company are Charles Duisdieker, president; Adam Saal, vice-president; Albert Stewart, secretary; William P. Herget, treasurer, and B. Matthessen, superintendent.

Central American Notes.

SAN JUAN, C. A., August 3, 1907.—Along the Pacific, steamship rates are increasing. The passenger rate from Valparaiso to Panama is now $219. By the German line, from San Francisco to Valparaiso, the rate is $292. The trip takes three weeks. By the Andes route, via Buenos Aires, Valparaiso is only 25 days from Europe, and the expense, first class, is under $200. This route would be much preferable for commercial travelers and others going from New York via any of the Brazilian or the lines from Buenos Aires. The Argentine Railway connects at Mendoza with the Transandine line, which gradually climbs to Las Cuevos. From this point to Juncal, coach or mules may be taken for a distance of some 18 miles. This is the only gap now wanting in the line, and work is being rushed on it at present. At Juncal the railroad is again taken for some hundred miles to Santiago (the capital) or Valparaiso. The total distance from Buenos Aires (Argentine) to Valparaiso, Chile, is about 900 miles by this route. Between these points 100 lb. of baggage is allowed on the railroad; excess is charged at $5 per 50 lb. The entire journey from Buenos Aires to Valparaiso takes about 40 hours. It is an easy journey and gives the business man from the United States a splendid chance to gauge the wealth of both these republics. On the way he can also visit the important cities of Rosario, Cor Doba, San Juan, and a number of others, according to his time. It is expected that branches from this line will soon be built northward into Bolivia and Paraguay, and southward into what was known as Patagonia and the mines of Tierra del Fuego.

The vanadium mines discovered and worked by Americans, not far from the line of the Oroya Railroad in Peru, are producing enormously. The roasting plant is working well, and many tons of the crude ore are now being shipped monthly to the United States.

Little can be said regarding peace in Nicaragua and Guatemala as long as they keep up their schemes of despoiling their neighbors. Everything is unsettled and business is at a standstill just now.

An important American firm is projecting a line of steamers from Coatzacoalco, the eastern terminus of the Tehuantepec Railroad, to New York. It is expected that California and Pacific freight will go over the Tehuantepec route to the east by the new steamer line.

Acepulco did not suffer much by the Guerrero earthquake. Several of the damaged buildings will be replaced by steel frames and corrugated iron. Considerable copper and gold ore is now being shipped from this port. It is hoped that the new railroad will open up the iron mines of Guerrero and Oaxaca; the deposits are large and relatively pure. Chiapas is also coming to the front in mining matters. Not far from Comitan, copper, silver and gold mines are now worked, and a find is reported in the Cordillera of rich tin pyrites. It will be easy to reach the mines as soon as the International Railroad is completed.

Honduras is trying to get its debts straightened out and continue the rebuilding of the Puerto Cortez Railroad. This line did much to build up the coffee, banana and mineral trade with the interior, and when it reaches Comayagua and the capital, Tegucigalpa, will make an easy route from the Atlantic to the heart of Central America. C.

July Exports and Imports of Iron and Steel.

As compared with June, increased values are shown in both exports and imports of iron and steel in the July report of the Bureau of Statistics of the Department of Commerce and Labor. The total value of the exports of iron and steel and manufactures thereof, not including ore, for July, was $17,614,017, against $17,226,259 in June. The value of the corresponding imports for July was $4,008,584, against $3,272,259 in June. Taking the commodities for which quantities are given, the exports in July totaled 121,400 gross tons, against 92,529 tons in June, 91,513 tons in May and 132,332 tons in April. The following table gives the exports of these commodities for July and for the seven months ending with July, in 1907 and 1906:

Exports of Iron and Steel.

	July,		Seven months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	6,405	6,530	48,035	46,477
Scrap	4,001	838	20,728	7,155
Bar iron	2,658	4,298	16,945	33,126
Wire rods	500	1,043	8,161	4,350
Steel bars	6,598	2,346	41,066	16,590
Billets, blooms, &c	3,486	16,970	54,269	146,503
Hoop, band, &c	1,345	172	3,865	2,212
Steel rails	37,705	23,623	180,720	203,352
Iron sheets and plates	4,078	1,144	22,099	6,600
Steel sheets and plates	4,960	7,494	54,100	52,083
Tin and terne plates	1,185	552	7,492	10,060
Structural iron and steel	12,102	10,300	77,089	62,710
Wire	13,742	9,668	89,644	98,343
Cut nails	506	603	4,326	4,120
Wire nails	4,204	3,463	25,681	31,223
All other nails, including tacks	687	445	4,889	2,823
Pipes and fittings	17,238	9,348	82,914	88,228
Totals	121,400	98,837	742,023	815,955

Continuing the comparison of commodities for which quantities are given, the total imports for July were 75,406 gross tons, against 60,960 tons in June. The following table shows the imports of these commodities for July and for the seven months ending with July in 1907 and 1906:

Imports of Iron and Steel.

	July,		Seven months.	
	1907.	1906.	1907.	1906.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	53,998	37,509	385,829	184,322
Scrap	4,529	113	16,725	9,961
Bar iron	3,744	4,164	22,933	20,547
Rails	893	466	2,613	2,519
Hoop, band, &c	2	27	1,316	7,204
Billets, bars and steel steel in forms n.e.s.	1,297	1,050	9,089	11,659
Sheets and plates	366	137	2,592	2,165
Tin and terne plates	8,845	4,904	39,715	29,128
Wire rods	1,547	1,714	10,590	10,649
Structural iron and steel	185	2,103	1,788	22,953
Totals	75,406	52,187	493,190	301,107

The quantity of iron ore imported in July was 121,844 gross tons, against 75,429 tons in the corresponding month of last year.

The Iron and Metal Trades

There are indications that the long continued deadlock in the Foundry Pig Iron markets is soon to be broken, although those buyers who are testing the market do not reach far into the future in covering their requirements. Still, it is a fact that the prices to which the markets have worked down, notably in the East, are proving attractive to some melters. The movement, however, is at best only in its preliminary stages.

The leading Southern Pig Iron interests are still behind in their deliveries and are maintaining a conservative attitude toward the market. Smaller interests, however, are willing to make concessions, and $18 to $18.50 is being quoted for delivery during the last quarter. There is a feeling in the Southern Iron trade that shortage of Lake Ores may, in the winter and spring, divert Pig Iron tonnage to the Southern producers. It is a fact that normal conditions have not yet been restored on the Mesaba range.

The rolling mills and steel works are running at the highest speed and it is probable that before the close of October some records will be broken. There is still a shortage of Steel which has been emphasized in the Central West in Sheet Bars by the shut down of the Shenango works of the Steel Corporation and the breakdown of the sheet bar mill of the Youngstown Sheet & Tube Company.

While specifications against old orders continue heavy and are crowding the mills, still new business is coming in to some of the large interests in considerably reduced volume, foreshadowing a lighter business in the winter and spring. This is not unwelcome since it will permit of weeding out of the poor material in the labor crews, and restore to some extent the greatly impaired efficiency of labor.

Conferences are now in progress between the representatives of the railroads and of the rail mills, over the specifications and the sections, and an early settlement is hoped for. In the meantime there is a little more movement in the rail trade. Among the orders just placed are 3000 tons for the Kanawha & Michigan, 5000 tons for the Hocking Valley, and 4000 tons for the Toledo & Ohio Central. It is understood, too, that further reservations for next year have been made. The Manchurian order will probably not be placed at once for the whole tonnage called for. The first lot will be for about one-fifth of the whole requirements.

In Pittsburgh the McClintic-Marshall Company has secured the 3000 tons for the structural work for the new open hearth plant of the Pittsburgh Steel Company. There is pending in the same city a contract for 10,000 tons for the Oliver estate, while in this city bids are going in for 6000 tons for the approach of the Blackwells Island Bridge. Structural contracts are keeping up surprisingly well. During August the American Bridge Company booked 53,000 tons and other fabricators report a good tonnage. During August the mills of the Steel Corporation rolled the record tonnage of large Beams.

The American Steel & Wire Company has just announced an advance of $1 per ton on Wire Products. The same company has established new discounts on Shafting and has announced that the former practice of base territory quotations has been discontinued.

The leading Copper selling agencies have opened their books for September and October deliveries of Electrolytic at 18c., and the lower quotations made recently by smaller sellers have been withdrawn. Large buyers state that they will purchase only for early requirements, not being thoroughly satisfied that the situation is sound on the new basis. Evidence is accumulating that rather more Copper was slipped upon the market during the past month under official prices than the trade was generally cognizant of, quite apart from liberal sales for shipment abroad.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 4, 1907.	Aug. 28, 1907.	Aug. 1, 1907.	Sept. 5, 1906.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$21.00*	$21.50	$22.00	$20.25
Foundry No. 2, Southern, Cincinnati	*21.75*	22.25	23.75	18.50
Foundry No. 2, Local, Chicago	24.50	24.50	24.50	19.75
Bessemer, Pittsburgh	22.90	22.90	22.90	19.35
Gray Forge, Pittsburgh	*21.40*	21.40	22.40	18.35
Lake Superior Charcoal, Chicago	*27.00*	27.50	27.50	20.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	*29.00*	29.00	30.00	28.00
Forging Billets, Pittsburgh	*33.00*	33.00	34.00	34.00
Open Hearth Billets, Phila	*31.50*	31.50	31.75	30.00
Wire Rods, Pittsburgh	*36.00*	36.00	36.50	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*17.00*	17.00	17.25	16.50
Steel Rails, Melting, Phila	*16.75*	16.50	17.50	18.00
Iron Rails, Chicago	*20.25*	20.50	20.75	23.50
Iron Rails, Philadelphia	*20.50*	20.50	22.50	24.00
Car Wheels, Chicago	24.50	24.50	24.50	20.00
Car Wheels, Philadelphia	*23.00*	23.00	25.00	17.50
Heavy Steel Scrap, Pittsburgh	17.75	17.75	17.75	16.75
Heavy Steel Scrap, Chicago	*14.75*	14.75	15.50	16.50
Heavy Steel Scrap, Philadelphia	*16.50*	16.50	17.00	17.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.85	1.85	1.85	1.63½
Common Iron Bars, Chicago	1.78	1.78	1.78	1.71½
Common Iron Bars, Pittsburgh	1.70	1.70	1.70	1.50
Steel Bars, Tidewater, New York	1.86	1.86	1.86	1.64½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.74½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.85*	1.85	1.90	1.57½
Skelp, Sheared Steel, Pittsburgh	**1.95**	1.95	1.90	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.40
Wire Nails, Pittsburgh	**2.05**	2.00	2.00	1.85
Cut Nails, Pittsburgh	**2.10**	2.10	2.05	1.75
Barb Wire, Galv., Pittsburgh	**2.50**	2.45	2.45	2.30
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*18.12½*	18.25	21.00	18.87½
Electrolytic Copper, New York	*17.50*	17.50	20.00	18.75
Spelter, New York	*5.50*	5.60	5.95	6.00
Spelter, St. Louis	*5.37½*	5.45	5.80	5.90
Lead, New York	*5.12½*	5.10	5.15	5.85
Lead, St. Louis	*4.95*	4.95	5.00	5.75
Tin, New York	*37.12½*	37.40	40.25	40.60
Antimony, Hallett, New York	*9.00*	9.00	10.50	24.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$4.09	$4.09	$4.09	$3.94

Chicago.

FISHER BUILDING, September 2, 1907.

With an inflow of specifications in all lines of finished material great enough to fully engage the mill capacities, present conditions in those branches of the Iron and Steel industry are highly satisfactory. It is generally recognized, however, that the volume of fresh orders in most lines is falling short and that in consequence the unprecedented congestion of mill books will, within a comparatively short time, be relieved. Whatever developments the coming year may bring, there is no present prospect of radical decrease in mill activities during the remaining months of this year. Last week's Rail purchases added 10,000 tons to the bookings of the Illinois Steel Company for 1908 delivery. In view of the known Rail requirements yet unprovided for, it is thought that as soon as the question of specifications and qualities is settled active buying will begin. Notwithstanding that few of the pending construction jobs involving large tonnage have recently been closed, there is, nevertheless, a good business constantly developing from small contracts, which include an important aggregate tonnage. Confirming rumors current of its contemplated action, the American Steel & Wire Company has announced $1 a ton advance in price of Wire and Wire Products, including Wire Nails, Smooth and Barb Wire, &c. It has also announced the discontinuance of base territory discounts in Shafting and a revision of discounts. Pig Iron continues weak, with a constant tendency toward lower prices, which only a strong buying movement will effectually check. This at the present time is not in sight, but it is still stoutly maintained that

founders' fourth quarter requirements will necessitate some heavy purchases. Scrap Material found a temporary prop against further decline in a demand from dealers to supply expiring contracts. It is hardly expected that it will maintain its present level now that this supporting influence is withdrawn.

Pig Iron.—Continued inactivity bears heavily on the market, and further yielding of prices is the result. The only transaction of the week reported for other than carload lots was the sale of 1000 tons No. 2 Northern for fourth quarter. One inquiry for 5000 tons appeared in the market, but it was of a tentative nature, the requirements being contingent upon the securing of certain casting contracts. An indication pointing to a decrease in the melt is found in the fact that more requests for the withholding of shipments on contract are coming in; these, however, come mainly from the smaller foundries. As against this condition, it is reported that the larger melters are generally asking for their full quota of shipments. Although $18.50 to $19 represents the general range of prices for the last quarter, it is not questioned that $18 can be done for No. 2 Foundry, Birmingham. Under present conditions, it is not surprising that there is no buying for first quarter to speak of. What price limit an offer of good tonnage for this period would bring out can scarcely be determined in advance of the transaction, but it is certain that $17.50 can be had for deliveries through the first half. The situation among the Northern furnaces is a little stronger for the reason that as yet practically no tonnage is piling on the yards. Northern No. 2 for last quarter is held at $23.50 to $24, Chicago, and though, as in Southern Iron, the price for first quarter is not definitely established, $21 to $21.50 is asked. The following prices are for September delivery, f.o.b. Chicago:

Lake Superior Charcoal	$27.00 to $27.50
Northern Coke Foundry, No. 1	25.00 to 25.50
Northern Coke Foundry, No. 2	24.50 to 25.00
Northern Coke Foundry, No. 3	23.50 to 24.00
Northern Scotch, No. 1	25.50 to 26.00
Ohio Strong Softeners, No. 1	25.50 to 26.00
Ohio Strong Softeners, No. 2	25.00 to 25.50
Southern Coke, No. 1	23.85 to 24.35
Southern Coke, No. 2	23.35 to 23.85
Southern Coke, No. 3	22.85 to 23.35
Southern Coke, No. 4	22.35 to 22.85
Southern Coke, No. 1 Soft	24.85 to 25.35
Southern Coke, No. 2 Soft	24.35 to 24.85
Southern Gray Forge	20.85 to 21.35
Southern Mottled	20.85 to 21.35
Malleable Bessemer	24.40 to 24.90
Standard Bessemer	24.90 to 25.40
Jackson Co. and Kentucky Silvery, 6 %	30.40 to 30.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	34.40 to 34.90

Billets and Rods.—Local consumers have their requirements for Forging Billets well covered by contracts; at least no inquiries for new tonnage are reported in the market from these sources. There is practically no surplus available from local producers for the general market. No sales of consequence have as yet resulted from the large inquiries recently in the market. Forging Billets are still quoted at $36 to $38, Chicago; Wire Rods at $36 to $37, Pittsburgh.

Rails and Track Supplies.—Rail sales totaling 10,000 tons are reported for the week. This tonnage is comprised of two orders, both for 1908 delivery and both taken by the Illinois Steel Company, one of 8000 tons, from a Western road, and the other of 2000 tons for an electric traction line. Sharing the slow movement in Rails, Angle Bars, Spike and Track Supplies are correspondingly quiet. There is on the other hand a good demand for Light Rails, specifications to the amount of 4000 tons having been booked last month by the Illinois Steel Company. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 2.20c. to 2.30c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $34; 25-lb., $35; 20-lb., $36; 16-lb., $37; 12-lb., $38, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The Illinois Steel Company has specifications already in hand sufficient to engage its rolling capacity for Shapes well up to the close of the year. Its engagements in orders will carry it well over into the early months of the new year. Only the usual run of small contracts in Structural fabrication were closed in the past week. Several of the large deals pending are making favorable progress, and will doubtless come to closure in the near future. It is reported that the letting of contracts on the new Milwaukee Auditorium, which were to have been placed last week, was withheld because of the excess of bids over builder's estimates. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chiago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—New business is notably quiet, but specifications against contracts are plentiful. In view of the heavy shipments going forward from the mills and the lessened volume of new business coming in, it looks as though relief from the congestion that has retarded deliveries through the year may be expected before very long. We quote for future delivery as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—While shipments of Black Sheets are being made with reasonable promptness, on Galvanized they are still somewhat slow. A marked decrease in the price of Spelter has stimulated production in Sheet galvanizing departments, which are being crowded to fullest capacity. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.40c.; No. 12, 2.45c.; No. 14, 2.50c.; No. 16, 2.60c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 20, 3.20c. to 3.30c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—A demand that for the season of the year is considered very satisfactory is noted for Bar Iron. Numerous orders are daily developing, but they are usually for lots of small tonnage, and represent the requirements of a wide range of interests. The car builders, however, who are the heaviest users of Iron Bars, are at present contributing very lightly to the general demand. Prices, which until recently were slightly unsettled by shaded offerings of a small interest, no longer in operation, are now firm at the regular quotation. New business on Steel Bars consists of desultory orders of no important tonnage, but specifications are not only being offered earlier than usual, but are extremely heavy. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.78c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Save that in its general volume new business has declined from the phenomenal proportions it has for many months maintained, and that in consequence mill shipments are at last in ascendancy over incoming orders, there is no notable change in the situation. Throughout the West the demand still continues strong, and the inconveniences arising from delinquent deliveries are, and will of necessity for some time to come remain, a source of annoyance to both producer and consumer. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots, Chicago jobbers quote 68 per cent. on Black Steel Pipe, ¾ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Heavy shipments on contracts are being made, but the mills are badly behind on deliveries. The demand from jobbers' stocks is on some sizes in excess of replenishments, and urgent wants are sometimes supplied only by cutting lengths. Forward delivery business, however, is not so crowding. Mill quotations for future delivery on the base sizes are as follows: 2¾ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Weakness in Shafting, reflected by the persistent shading of nominal discounts currently quoted, has been followed by the establishment of new discounts by the American Wire & Steel Company, together with the announcement that the former practice of base territory quotations has been discontinued. Discounts now quoted by this company make the price Pittsburgh delivery, in accordance with which prices are herewith revised. Specifications on miscellaneous Shapes and Bars are freely offered, though

the tonnage of new business coming in is light. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish, up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 60 per cent. off in car lots; 55 per cent., less than car lots, Pittsburgh.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was the lowest bidder on the Columbus, Ohio, requirement let last week. Since the bid was within the amount appropriated, it is probable that the order, which at a previous letting was withheld, will now be placed. Beyond the 5000 tons for Kansas City, heretofore mentioned, which comes up this week, there are no lots of importance in prospect for the immediate future. While there is no definite change in prices, it is noted that the inside figures of the spread in recent quotations now represent only the average of the market. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., $38; 6 to 12 in., $37; 16-in. and up, $36, with $1 extra for Gas Pipe.

Coke.—A brisk movement in contracting for forward foundry requirements has resulted in the placing of a number of fair sized orders during the week. Prompt delivery sales were also fairly satisfactory. For genuine Connellsville Foundry Coke prices range from $3.15 to $3.50, at oven.

Old Material.—Prices have held about stationary through another week, in spite of market conditions, that are generally conceded to be fundamentally weak. A large portion of the tonnage covered by dealers' contracts was due for delivery on September 1, and the buying occasioned by the efforts of these interests to avoid delinquency, and consequent cancellations, furnished the principal support that served to hold the market steady. With the removal of this bracing influence further sagging in some grades at least seems inevitable. Consumers both of mill and melting stock are well supplied with material, and on such purchases as are made the buyer usually names the price. Old Car Wheels hold firmer than other grades, two sales at $25 per gross ton, one amounting to 250 tons, being noted, and the offer of a small lot at $24.50 being reported. In addition to a list of 1300 tons offered by the Chicago & Northwestern, bids are asked by the same road on from 1000 to 1200 tons of Old Iron Rails, to be delivered within the next 60 days. We quote per gross ton, f.o.b. Chicago:

Old Iron Rails	$20.25 to $20.75
Old Steel Rails, rerolling	16.75 to 17.25
Old Steel Rails, less than 3 ft	17.00 to 18.00
Relaying Rails, standard sections, subject to inspection	28.00 to 30.00
Old Car Wheels	24.50 to 25.00
Heavy Melting Steel Scrap	14.75 to 15.25
Frogs, Switches and Guards, cut apart	15.50 to 16.00
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$16.25 to $16.50
Iron Car Axles	23.00 to 23.50
Steel Car Axles	20.00 to 20.50
No. 1 Railroad Wrought	14.25 to 14.75
No. 2 Railroad Wrought	13.50 to 14.00
Railway Springs	14.50 to 15.00
Locomotive Tires, smooth	17.50 to 18.00
No. 1 Dealers' Forge	12.00 to 12.50
Mixed Busheling	10.50 to 11.00
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.50 to 11.00
Cast Borings	8.50 to 9.00
Mixed Borings, &c	9.00 to 9.50
No. 1 Mill	9.75 to 10.25
No. 2 Mill	8.75 to 9.25
No. 1 Boilers, cut to Sheets and Rings	10.00 to 10.50
No. 1 Cast Scrap	17.00 to 17.50
Stove Plate and Light Cast Scrap	14.00 to 14.50
Railroad Malleable	16.00 to 16.50
Agricultural Malleable	14.75 to 15.25
Pipe and Flues	11.25 to 11.75

Metals.—The market seems irregular and ragged, with a steady drift toward lower levels. Copper prices reflect in further decline the lack of interest on the part of consumers. A firmly established conviction among users that the bottom has by no means yet been reached is largely responsible for the disinclination shown to anticipate requirements. In sympathy with the sagging of new material, Old Metals are also lower, prices on which are herewith revised. We quote as follows: Casting Copper, 19½c. to 20c.; Lake, 20¾c. to 21c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 38¾c.; small lots, 39½c.; Lead, Desilverized, 5.75c. to 5.85c., for 50-ton lots; Corroding, 6.40c. to 6.50c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 6.10c.; Cookson's Antimony, 16c., and other grades, 15c. to 15½c.; Sheet Zinc is $7.75 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 15c.; Heavy Copper, 15c.; Copper Bottoms, 14c.; Copper Clips, 15c.; Red Brass, 14c.; Red Brass Borings, 11c.; Yellow Brass, 11c.; Yellow Brass Borings, 9c.; Light Brass, 8c.; Lead Pipe, 4c.; Tea Lead, 3¾c.; Zinc, 4¼c.; Pewter, No. 1, 25c.; Tin Foil, 28c.; Block Tin Pipe, 33c.

Pittsburgh.

PARK BUILDING, September 3, 1907.—(*By Telegraph.*)

Pig Iron.—Total sales of Bessemer Pig Iron in August footed up about 21,000 tons, the average price being $22, Valley furnace, or $22.90, Pittsburgh. There is at present practically no inquiry for Bessemer or Basic Iron, the former being fairly strong at $22, at furnace, but a sale of 1000 tons is reported at $21.50, Valley furnace. Basic Iron is nominally $21, at furnace, but no sales have been reported for some time. Inquiries for Foundry Iron are altogether for small lots for prompt shipment, consumers declining to contract ahead. We quote Northern No. 2 Foundry for spot shipment at $21.50 to $22.50, Valley furnace, the higher price being paid for certain brands which consumers have been using and do not care to make a change. For forward delivery Northern No. 2 Foundry is about $21, Valley furnace, or $21.90, Pittsburgh, but on a firm offer for large tonnage, and for extended delivery, it is possible that less than $21, at furnace, could be done. There have been no sales of Forge Iron of any consequence in this market for some time. Southern Forge can be bought as low as $16, Birmingham, equal to $20.85, Pittsburgh, while Northern Forge is nominally $20.50, at furnace, or $21.40, Pittsburgh. At a firm offer it is probable that Northern Forge could be bought as low as $20, at furnace, or $20.90, Pittsburgh.

Steel.—There seems to be a little more inquiry for Billets, and with a continued scarcity in supply prices are firm. The Carnegie Steel Company has 25,000 to 30,000 tons of Billets still due from outside concerns, and will probably not buy any more Steel until deliveries have been made on these countracts. We quote Bessemer Billets at $29 to $29.50, and Open Hearth at $31, Pittsburgh. Sheet and Tin Bars are $31, maker's mill, while Forging Billets are held at about $33, Pittsburgh.

(*By Mail.*)

Developments of the past week in the Steel trade have been of a more favorable character and the first signs have appeared of the long hoped for buying movement, which is expected to be in full swing by the middle of September or not later than October 1. The Carnegie Steel Company reports sales in the past week of about 60,000 tons of Standard Section Steel Rails for 1908 delivery, and indications are that other railroads are getting ready to reserve space on the rolling schedule of the Rail mills, and it is believed that in the next two months a very heavy tonnage of Rails will be placed. The Pig Iron market continues extremely quiet, but prices are quite firm at $22, Valley furnace, on Bessemer Iron, with little offered. The Steel market is firm, and a shortage in Sheet Bars has developed, owing to the shutdown of the Shenango Works of the Carnegie Steel Company, at New Castle, and the breakdown of the Sheet Bar mill of the Youngstown Sheet & Tube Company. In Finished Iron and Steel speculative buying has entirely disappeared, and orders being placed are for actual requirements. The leading mills are pretty well filled for the next three or four months, but are gradually catching up on back shipments. Taken as a whole, the situation looks better than at any time in the past three or four weeks, and it is believed new business in September will show a decided increase over last month. There is a better tone to the Scrap market, while the demand for Furnace Coke is active, with prices ruling very firm.

Ferromanganese.—The demand continues quiet, but there is some little inquiry for Ferro for delivery in the last three months of the year. We quote 80 per cent. English for prompt delivery at about $62, and for last quarter at about $60, Pittsburgh.

Muck Bar.—Some inquiry has come up in the past week, but the available supply of high grade Muck Bar is limited. We quote best grades, made from all Pig Iron, at $36 to $36.50, Pittsburgh.

Skelp.—The mills are filled with work for two or three months ahead, and both Iron and Steel Skelp for prompt delivery is hard to obtain, several makers advising us they are turning down a large tonnage right along, being unable to make deliveries wanted. Prices are strong, and we quote: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.95c. to 2c.; Grooved Iron Skelp, 2.15c. to 2.20c., and Sheared Iron Skelp, 2.25c. to 2.40c., depending on sizes and widths. All these prices are f.o.b. maker's mill.

Wire Rods.—A fairly active demand is noted for Wire Rods, which are scarce and hard to obtain for prompt shipment. The American Steel & Wire Company and Pittsburgh Steel Company, the two leading makers of Wire Rods, have not been active sellers in the open market for a long time. We quote Bessemer Rods at about $36 and Open Hearth at about $37, Pittsburgh.

Rails.—In the past week the Carnegie Steel Company

has booked orders for about 60,000 tons of Standard Sections for 1908 delivery. Some of the railroads were desirous of securing rolling space with the Rail mills for next year, and these contracts have been taken, subject to prices that may be made, and specifications adopted as a result of the conferences now being held between the Rail mills and the railroads as to the proper specification of Rail that will best meet the requirements of greater speed and heavier rolling stock. The Carnegie Steel Company still has a large tonnage of Rails on its books for delivery this year and will probably put the Ohio Works, at Youngstown, on Rails to help out on these contracts, which ought to be filled before November 1, or before cold weather sets in, which would interfere with track laying. The demand for Light Rails is quite active and the Carnegie Company is practically sold up on these for the balance of the year. We quote Light Rails as follows: $33 to $34 for 20 to 45 lb.; $34 to $35 for 16-lb., and $35 to $36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at $28, at mill.

Plates.—The actual new business being placed is lighter than for some time, but the leading Plate mills still have an enormous tonnage on their books on which they are still much behind in shipments, but are slowly catching up. The Steel car interests are taking out their full requirements of Plates, but some other consumers are not taking in as large a tonnage as they did some time ago. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—The McClintic-Marshall Construction Company has taken a number of new Steel buildings for the new Open Hearth plant of the Pittsburgh Steel Company, Monessen, Pa., calling for about 3000 tons. The Pittsburgh Construction Company is finishing up some viaduct work in the Cuyahoga Valley at Cleveland, which has been running along for a year or more, and in which about 5000 tons of Steel have been used. The mills are making better deliveries on Structural Shapes and on Structural Plates than for some time. The fabricating concerns report they are fairly well filled with work for the balance of this year, but the tightness in the money market is being felt, and has resulted in a number of large jobs going over into 1908, that otherwise would have been placed this year. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The mills have pretty well caught up on back deliveries of Black Sheets, with the result that premiums for prompt deliveries have pretty well disappeared, but on Galvanized Sheets leading mills are still from two to three months behind, and are catching up rather slowly. There has been a decided shortage in the supply of Sheet Bars recently, due to the shutdown of the Shenango works of the Carnegie Steel Company at New Castle and the breakdown at the Sheet Bar mill of the Youngstown Sheet & Tube Company. The price of Sheet Bars for the last quarter of the year delivery will remain at $31, Pittsburgh, the same figure that ruled for present quarter. Prices on Sheets are firm and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; No. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 2 gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—The amount of new tonnage being placed is moderately heavy, while specifications against contracts are coming in freely, shipments by the mills at present being as large as at any time this year. Prices are firm and we quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Cotton Ties.—The season is about over, but a few stray orders are still being placed at 96½c. per bundle at mill.

Tin Plate.—There are indications that the large canning interests will come in the market this month with their contracts for Bright Plate for October and November shipment, and while the tonnage in these contracts will not be as heavy as last year it will be large enough to give the Tin Plate mills practically full work for the balance of this year. The price of Tin Bars for last quarter delivery will remain at $31, Pittsburgh, and it is not believed there will be any reduction in the price of Tin Plates this year. We quote $3.90 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Bars.—The price of puddling to mills rolling Iron Bars that signed the Amalgamated scale since August 12 has been $6.62½ instead of $6.50, as stated in this report last week. A fair amount of business is being placed in Iron and Steel Bars, but the mills are running mostly on specifications against contracts, which are coming in freely, and the Steel Bar mills are pretty well filled with work for the rest of this year. Prompt deliveries of Steel Bars still command premiums of $2 to $3 a ton. We quote Iron Bars at 1.70c., Pittsburgh, but on a desirable tonnage some mills might shade this about $1 a ton. We quote Steel Bars for forward delivery at 1.60c., base, half extras, f.o.b. Pittsburgh, and for prompt shipment at 1.75c. to 1.80c., Pittsburgh.

Spelter.—The demand continues dull, while prices have shown a further sharp decline. We quote prime grades of Western Spelter at 5.40c., St. Louis, equal to 5.52½c., Pittsburgh.

Merchant Steel.—New business being placed is rather light, the mills running mostly on specifications against season contracts placed some time ago. Some contracts for Shafting placed a good while ago are now being filled at prices slightly less than recently quoted. We quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Railroad Spikes.—The demand for standard sizes continues very dull, and the leading makers are actively seeking new business. For the smaller sizes the demand is active, the makers being filled for two to three months ahead, and are therefore behind in shipments. We quote standard sizes at $2 to $2.10 and smaller sizes at $2.25 to $2.35 per 100 lb., f.o.b. maker's mill.

Boiler Tubes.—The demand has been rather quiet for some time, new business being light. An item of interest in the Tube trade is that the National Tube Company is furnishing large orders for Spellerized Steel Tubes to take the place of Charcoal Iron Tubes. A number of leading railroads have had sets of the Spellerized Tubes for test purposes for the past six months, and the results of these tests have been so satisfactory that large orders have been the result. The Spellerized Tubes are furnished by the National Tube Company at lower prices than are charged for Charcoal Iron Tubes, one office of the company having sent in orders in the first eight months of this year for five times as many Spellerized Tubes as for Charcoal Tubes during all of last year. Official discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in	42	47
1¾ to 2¼ in	42	59
2½ in	47	61
2¾ to 5 in	52	65
6 to 13 in	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Scrap.—There is a little better inquiry for both Iron and Steel Scrap, and the tone of the market is slightly stronger. However, consumers still continue to limit purchases to actual requirements, and the amount that is changing hands is relatively small. Dealers quote about as follows: Heavy Steel Scrap, $17.75 to $18 for Pittsburgh, Steubenville or Sharon delivery; No. 1 Railroad Wrought Scrap, $17.75 to $18; Rerolling Rails, $18.25 to $18.50; No. 2 Wrought Iron Scrap, $17.25 to $17.50; No. 1 Busheling Scrap, $17 to $17.25; No. 2, $13.50 to $13.75; Bundled Sheet Scrap, $15.50 to $15.75; Low Phosphorus Melting Stock, $21.50; Old Steel Rails, short pieces for Open Hearth use, $17.75 to $18; No. 1 Cast Scrap, $20 to $20.50; Cast Iron Borings, $13.25 to $13.50; Old Car Wheels, $25 to $25.50; Steel Axles,

$22.25 to $22.50; Stove Plate, 15.75 to $16; Grate Bars, $15.75 to $16. All above prices are per gross ton, f.o.b. buyer's mill, Pittsburgh, except otherwise noted.

Merchant Pipe.—New business placed in August showed a falling off as compared with the previous month, but the leading Pipe makers still have an enormous tonnage on their books, against which specifications are coming in freely, and these, with current business, will give the mills full employment for the balance of this year. One or two leading mills will probably carry over into 1908 a large tonnage of Pipe on which they were unable to make deliveries this year. Prices are firm, discounts being as follows:

Merchant Pipe.

	Jobbers, carloads. Steel.	
	Black.	Galv.
	%	%
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.

	Black.	Galv.
	%	%
¾ to 6 in	67	57
½ in	62	50
⅜ in	60	42
⅛ and ¼ in	58	42
7 to 12 in	62	47

Extra Heavy Iron Pipe, Plain Ends.

⅛, ¼ and ⅜ in	62	40
½ to 4 in	59	47
4½ to 8 in	55	42

Coke.—We note a sale of a round tonnage of Connellsville Furnace Coke for prompt shipment at $2.75 a ton at oven, and the market on genuine Connellsville Furnace Coke is now very firm, at $2.75 to $2.80 per ton at oven. Connellsville 72-hr. Foundry Coke is firm, at $3.15 to $3.50 at oven. Other makes of Furnace and Foundry Coke which do not run as high in quality are offered at somewhat lower prices. The output of Coke continues heavy, the Upper and Lower Connellsville regions having made last week 420,833 tons.

Cincinnati.

FIFTH AND MAIN STS., September 4, 1907.—(*By Telegraph.*)

Pig Iron.—The advent of September sees practically no change in the situation of a week ago—indeed of the past few weeks from the buyer's viewpoint. Furnaces having been kept busy on lower grade Irons principally, the wise ones are as much at sea on future possibilities as they were some time back. Competent sources of information agree that there is not a production to warrant any sort of radical change in prices to induce buying and the buyer seems content to pursue his hand to mouth policy, for no sales of importance are noted. The price, however, has dropped another 50c. per ton, with no perceptible increase in inquiry. The future is as much of an intricate problem as ever. No one will venture an opinion on next year's prices. There is some considerable commotion on in the lower grade irons, and the price seems to be adjusting itself to fit conditions which have produced these grades in rather more than normal quantities. While deliveries are fairly normal, it is quite agreed that furnaces are not making any Iron to store; in fact, there is a place for all the Iron of high grade that is turned out. The evidence of a prominent foundryman in this connection, who says his Iron of late has much of it come still hot when unloaded from the car is significant. A conservative estimate of the future, based on present facts and figures, seems to indicate that there is little chance for No. 2 Foundry to go below $18, Birmingham, except under special negotiation and because of at present unforeseen contingencies. It is felt that buyers will be coming into the market in good form within a month or six weeks for Iron for the first quarter and half, and then prices will be adjusted on a more substantial basis. Instances are noted of some resale Iron going as low as $18, Birmingham, during the week, but the tonnage is not large. In the subjoined quotations considerable change is noted in prices on Gray Forge and Mottled from the last report, various conditions which combined to make an overproduction of these grades having in inverse ratio affected the production of the better grades and fixed lower prices for the larger output. From the Hanging Rock District freight rates to Cincinnati

CONTENTS.

	PAGE.
The New Stoever Pipe Machines. Illustrated	613
Chicago Subway Traffic	614
Fluorspar Production in 1906	615
A New Doty Scrap Shear. Illustrated	616
The Alcohol Engine	616
Government Railroad Ownership in Mexico	616
The Peerless Gasoline Hoist. Illustrated	617
The Cement Industry in 1906	617
A New Milling Machine Dividing Head. Illustrated	618
Pneumatic Tools in England	619
Loads on Steel and Cast Iron Wheels	620
The Improved Lo-Swing Lathe. Illustrated	620
Trust Conference in Chicago	621
The Knoeppel Cupola Tuyere. Illustrated	622
Estimation of Carbon with the Shimer Crucible	623
Newfoundland's Iron Mines Under the Sea	624
Large Copper Elbows. Illustrated	624
The Sterling Motor Driven Hack Saw. Illustrated	625
The Vienna Meeting of the Iron and Steel Institute	625
The Caldwell Mechanical Coal Shovel. Illustrated	626
Customs Decisions	627
The Wells Manufacturers' Lathe. Illustrated	628
Pennsylvania Railroad Tunnels to be Ready in Two Years	628
The Ransom Water Tool Grinder. Illustrated	629
Proposed Rail Specifications	630
The American Locomotive Company	631
Boron Steels	632
Canadian Cement Production	632
The Central Foundry Company	633
Editorial:	
The Lake Erie-Ohio River Ship Canal	634
Conciliation in Great Britain	635
Coke and Pig Iron Shortages	635
Correspondence	636
Mesaba Labor Troubles Continue	637
Shipbuilding in the Maritime Provinces of Canada	637
Steel for Concrete Reinforcement	638
The Quebec Bridge Collapse. Illustrated	640
The Great Northern Ore Mines	643
Woven Wire for Concrete Reinforcement	643
Personal	644
Obituary	644
News of the Works:	
Iron and Steel	645
General Machinery	645
Power Plant Equipment	645
Foundries	645
Bridges and Buildings	646
Fires	646
Hardware	646
Miscellaneous	646
Central American Notes	647
July Exports and Imports of Iron and Steel	647
The Iron and Metal Trades:	
A Comparison of Prices	648
Chicago	648
Pittsburgh	650
Cincinnati	652
Birmingham	653
Philadelphia	653
Cleveland	654
Metal Market	654
New York	655
The Outlook for Canada's Pacific Province	656
Iron and Industrial Stocks	656
Trade Publications	657
The Machinery Trade:	
New York Machinery Market	658
Chicago Machinery Market	659
Cincinnati Machinery Market	660
Cleveland Machinery Market	660
Philadelphia Machinery Market	661
New England Machinery Market	662
Government Purchases	662
Hardware:	
Condition of Trade	664
Notes on Prices	667
Trade Items	669
Among the Hardware Trade	669
A California Store Booklet. Illustrated	669
A Good Traveling Salesman	670
The Parcels Post Question	670
Hardware Window Display. Illustrated	671
A Michigan Store's Holiday Window. Illustrated	672
A Selling Company for Screen Wire Cloth	672
Requests for Catalogues, &c	672
Parcels Post Boomers Hard at Work	673
Relation of Retail Merchants' Selling Prices to an Advancing Market	674
Business Methods in a Builders' Hardware Store. Illus.	676
The Trades 100 Years Ago. Illustrated	677
Miscellaneous Notes:	
Champion Lock Joint Metal Shingles	678
Dog Collar Padlocks Display Card	678
Bottle for Hot or Cold Liquids	678
The National Carbon Paint Company	678
Wilcox Wonder, Mounted Grindstone. Illustrated	678
Crown and Crescent Surface Hinge. Illustrated	679
The Thompson Patent Clamps. Illustrated	679
Compound Lathe Tool. Illustrated	679
Lehigh Washing Machine. Illustrated	680
Current Hardware Prices	681
Current Metal Prices	688

are $1.20, and from Birmingham $3.25. Quotations, f.o.b. Cincinnati, are as follows:

Southern Coke, No. 1	$22.25 to $22.75
Southern Coke, No. 2	21.75 to 22.25
Southern Coke, No. 3	21.25 to 21.75
Southern Coke, No. 4	19.75 to 20.25
Southern Coke, No. 1 Soft	22.25 to 22.75
Southern Coke, No. 2 Soft	21.75 to 22.25
Southern Coke, Gray Forge	19.00 to 19.50
Southern Coke, Mottled	18.50 to 19.00
Ohio Silvery, 8 per cent. Silicon	28.80 to 29.30
Lake Superior Coke, No. 1	22.00 to 22.50
Lake Superior Coke, No. 2	21.50 to 22.00
Lake Superior Coke, No. 3	21.00 to 21.50
Car Wheel Irons.	
Standard Southern Car Wheels	$29.25 to $29.75
Lake Superior Car Wheels	27.50 to 28.00

Coke.—The market has an upward trend, with stiffening prices. Some excellent inquiries have been received, and the outlook is good. The range is about $3.25 to $3.75, f.o.b. ovens, covering the most productive and favorite fields.

Finished Iron and Steel.—Little change is noted in the market, with a hardly perceptible increase in demand. Prices are firm. Quotations, f.o.b. Cincinnati, are as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 2c., with full extras; Steel Bars, carload lots, 1.75c., half extras; small lots from store, 1.95c., full extras; Base Angles, carload lots, 1.85c.; small lots from store, 2c. to 2.10c.; Beams, Channels and Structural Angles, carload lots, 1.85c., base; small lots from store, 2.15c. to 2.25c.; Plates, 14-in. and heavier, carload lots, 1.85c., base; small lots from store, 2.25c.; Sheets, No. 16, carload lots, 2.05c., and smaller lots from store, 2.60c.; No. 14, carload lots, 1.95c., and small lots from store, 2.50c.; Steel Tire, 1 x ¼ in. or heavier, 1.95c., in carload lots.

Old Material.—There is little or no movement in the Scrap market, the demand being restricted to very few articles, with trade considerably below normal. Prices have suffered a sharp decline on some items. Dealers' prices, f.o.b. Cincinnati, may be quoted about as follows:

No. 1 R. R. Wrought, net ton	$15.75 to $16.25
Cast Borings, net ton	8.00 to 8.50
Steel Turnings, net ton	11.00 to 11.50
No. 1 Cast Scrap, net ton	17.50 to 18.00
Old Iron Axles, net ton	25.00 to 25.50
Old Iron Rails, gross ton	24.00 to 24.50
Old Steel Rails, long, gross ton	17.50 to 18.00
Relaying Rails, 56 lb. and up, gross ton	27.50 to 28.00
Old Car Wheels, gross ton	23.00 to 23.50
Low Phosphorus Scrap, gross ton	19.50 to 20.00

Birmingham.

BIRMINGHAM, ALA., September 2, 1907.

Pig Iron.—The week just closed has developed more actual business in the Iron trade than has been noted for the past 60 days. We have found several transactions in lots ranging from 100 to 500 tons for September shipment at $19 to $20, Birmingham, for No. 2 Foundry and No. 2 Soft, whereas for some time there had been practically a total absence of any actual trade. A good deal of special high Silicon Irons has been sold during the week, at prices ranging from $20 to $21.50, f.o.b. Birmingham, for immediate shipment. One sale of 500 tons of Gray Forge Iron was reported at $15.50, Birmingham, and while this price for this grade should have nothing to do with fixing the market for the higher grades, yet some buyers have made use of this particular transaction in an endeavor to press down the price of Foundry Iron, and this one transaction has been given more publicity, apparently, than any other recent feature of the Iron market. The very fact that furnaces as a rule are still somewhat behind on their deliveries of the higher grades, and in addition have a large percentage of their prospective make of these higher grades sold for delivery during the remainder of 1907 on the basis of $18.50 and better for No. 2 Foundry, will have a strong tendency to hold the market firm at not less than $18.50, Birmingham, for No. 2 Foundry the next four months. Of course the lower grades will remain each a law unto itself as to price, being governed as to price by the quantities the furnaces turn out, as these inferior grades are seldom sold for forward delivery, the furnaces preferring to market them only as produced. The fact that a small quantity of "re-sale" Iron was recently offered in the Cincinnati market by several different selling agencies has also had some effect on the market here. It does not appear that there will be any very large increase in the production in the South during the remainder of 1907.

Cast Iron Pipe.—The market varies but little from week to week. Orders during the past month have been less numerous than during the first half of the year, but as manufacturers have their production sold for the next three or four months no uneasiness is felt over existing conditions. While the same prices are being named as have heretofore prevailed, it is pretty generally admitted that on an order for any quantity considerable concession could be secured. Quotations on Water Pipe are approximately as follows per net ton, f.o.b. cars here: 4 to 6 in., $34 to $35; 8 to 12 in., $33 to $34; over 12 in., average $31, with $1 per ton extra for Gas Pipe.

Old Material.—There is no improvement in the demand for Scrap and, if any change, the market is weaker now than a week since. Cast, which has been the best seller for months, is rather a drug on the market since the lower grades of Foundry Iron are more plentiful. The mills are taking on very little Wrought, and dealers having large stocks of this are offering it at concessions. Quotations are approximately as follows per gross ton, f.o.b. cars yards here:

Old Iron Rails	$22.00 to $22.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	17.00 to 17.50
Old Car Wheels	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	12.50 to 13.00
No. 1 Country Wrought	13.00 to 13.50
No. 2 Country Wrought	11.50 to 12.00
Wrought Pipe and Flues	12.50 to 13.00
Railroad Malleable	14.00 to 14.50
No. 1 Steel	14.50 to 15.00
No. 1 Machinery Cast	15.50 to 16.00
Stove Plate and Light Cast	12.00 to 12.50
Cast Borings	8.25 to 8.75

Philadelphia.

PHILADELPHIA, PA., September 3, 1907.

The downward tendency of the market is less distinct than it has been for several weeks, and from present appearances buyers and sellers appear to be getting closer together than for a long time. This does not by any means imply that prices are going higher, but that they are low enough to warrant fairly liberal purchases, so that those who are likely to need Iron during the remainder of the year will no doubt contract for considerable tonnages for delivery during the period named. Confidence in values has not gone far enough to encourage much buying for next year's deliveries, although something has been done, and if prices hold steady it will not be long before buying for 1908 becomes an important feature. The decline in prices during the past three or four months has no doubt discounted a great many unfavorable features, and has come so gradually that the trade hardly realizes its significance, but $5 per ton decline on Pig Iron is an important item, and reduces the risk to that extent at all events. The improvement in the financial situation is also a favorable influence, and if it continues it should be a strong support to the Iron market.

Pig Iron.—Prices are still difficult to quote with exactness. In the ordinary run of business there is one price; for a larger quantity, still another; and for large lots, still another, and a lower price is quoted, so that it is difficult to quote prices that meet every case. It is something, however, to feel that there is a bottom price—at any rate, a bottom for 1907 deliveries, and these are quoted below. For 1908 there is still more or less unsettlement, although it is not by any means certain that prices will be lower than for 1907, but the market is not open yet, so that that portion can be left to take care of itself for the present. The range for 1907, however, for deliveries in eastern Pennsylvania and adjoining districts would be about as follows:

No. 2 X Foundry	$21.00 to $21.75
Gray Forge	18.75 to 19.50
Basic	19.50 to 20.00
Low Phosphorus	28.00 to 28.50

Old Material.—The market is steadier than it has been for some time, although it cannot be said that prices are any better. There is a better feeling, however, and buyers find it more difficult to force deliveries. Bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails and Crops	$16.75 to $17.25
No. 1 Steel Scrap	16.50 to 17.00
Low Phosphorus	22.00 to 22.50
Old Steel Axles	20.00 to 20.50
Old Iron Axles	27.50 to 28.50
Old Iron Rails	20.50 to 21.00
Old Car Wheels	23.00 to 23.50
Choice No. 1 R. R. Wrought	18.00 to 18.50
Machinery Castings	18.00 to 18.50
Wrought Iron Pipe	14.50 to 15.00
No. 1 Forge Fire Scrap	14.75 to 15.00
Wrought Turnings	14.00 to 14.50
Stove Plate	14.50 to 15.00
Cast Borings	13.00 to 13.50
Grate Bars	14.50 to 15.00
No. 2 Light Sheet Steel	13.00 to 14.00

For the fire protection of Winnipeg, Canada, a high pressure water system has been installed, equipped with four sets of double acting three throw pumps, each having a capacity of 2166 gal. per minute, against a pressure of 300 lb. and two sets each of half that capacity. These pumps are driven by one 540 hp. and two 270 hp. producer gas engines. The air compressing plant and storage tanks are in duplicate. The whole plant can be started within 1 min. Heavy cast iron 20-in. mains have been laid in the principal business districts, and are kept constantly charged. The pumps were furnished by Glenfield & Kennedy, and the engines and producer plant by Crossley Brothers, Manchester, Eng.

Cleveland.

CLEVELAND, OHIO, September 3, 1907.

Iron Ore.—The movement of Ore from the upper lake ports is showing further improvement, and the shipments are now very satisfactory, although they would be considerably heavier were it not for the scarcity of labor in many of the mines. Although figures are not yet available it is believed that the August Ore receipts were heavier than in the corresponding month last year, when they reached 5,665,815 tons. It is expected that the September movement will exceed that of August. Considerable Ore is now being placed on the docks, the percentage that is being sent directly to the furnaces being less than earlier in the season. The Ore market is very quiet, but prices are firm. There is only an ocasional inquiry for a small lot, but the amount of tonnage available for sale is small. Prices are as follows, at Lake Erie docks, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.25; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—A slight improvement is noted in the demand for spot Iron, although the sales are limited to small lots, one consumer seldom wanting over two or three carloads. Consumers are buying only for their immediate needs, and there is an entire absence of inquiries for Iron for the last quarter, as well as for the first part of next year. Some foundries are getting Iron faster than they can melt it, but requests for suspension of shipments are not frequent. An improvement in the market is expected before the close of the month. Foundries will soon be making contracts for work for next year's delivery, and it will be necessary for them to get prices on Pig Iron on which to base those contracts. Sales of Iron that have been made during the week were at $22.50 and $23 for No. 2 Northern Foundry, for prompt shipment. The same grade of Iron is held at $22.50 for last quarter delivery, but that price would probably be shaded to $22. Furnaces are still holding the minimum price on No. 2 Foundry Iron for the first half of next year at $21.50, at furnace. A few inquiries have appeared for Southern Iron, but no sales are noted. There are no inquiries for Basic Iron. Quotations for the last quarter of 1907, f.o.b. Cleveland, are as follows:

Bessemer	$22.90
Northern Foundry, No. 1	23.00
Northern Foundry, No. 2	22.50
Northern Foundry, No. 3	22.00
Gray Forge	21.40

Coke.—There is a scarcity of the better grades of both Furnace and Foundry Coke, and prices are very firm. There is little of either grade of Coke of the standard brands left for sale for this year's delivery. We quote Connellsville Furnace Coke at $2.75 to $3, at oven. The former price can be secured for extended delivery. We quote 72-hr. Foundry Coke at $3.25 to $3.50, at oven.

Finished Iron and Steel.—Specifications are coming in in fairly good shape in all lines of Finished Material, but more particularly in Steel Bars and Structual Material. All consumers that have material under contract appear to be specifying quite freely. The volume of new business is small, although many orders are coming in for small lots, the specifications accompanying the orders. The demand for Light Rails for mines is picking up, and there are a number of inquiries in the market. One sale of 300 tons of Light Rails is noted. The demand for Steel Bars continues good, and the implement makers are specifying for considerable tonnage on their contracts. One large producer of Iron Bars reports an improvement in the demand, although prices remain weak. With a better demand for Light Rails there is more demand for Spikes. The Plate situation has eased up considerably, but mills doing a premium business still report a fair demand for Tank Plates at a premium of $2 a ton. A few good orders for Universal Plates have been taken by an Eastern mill in the local market during the week. No new contracts for the building of lake boats for 1908 delivery have been closed for three or four weeks, but there are several pending, the delay in closing the deals being attributed to the tightness of the money market. Good specifications are coming in for Structural Material for boats already under contract. The demand for Structural Material continues good, but it is not quite as heavy as it was two or three weeks ago. The contract was awarded by the Pennsylvania Railroad during the past week for one grade crossing elimination in this city to the Cowing Engineering Company. The contract will require 1500 tons of Structural material. Considerable other grade crossing elimination work will probably be started here by the same railroad within the next few months. The Billet situation is easier. Mills that can make prompt shipment quote Forging Billets at $34 to $35, Cleveland. Warehouse business has been light. The amount of business taken by the local jobbers during August will aggregate about the same as their July business. One jobber placed an order during the week for 1800 tons of Bar products for future delivery to replenish stock. We quote Steel Bars at 1.70c., Cleveland, for car lots for future delivery, with half extras. Iron Bars are quoted by local mills at 1.65c., Cleveland, and outside mills quote Iron Bars at 1.60c. to 1.65c., Pittsburgh. We quote Beams and Channels at 1.80c., base, Cleveland, for carload lots, and Plates, ¼-in. and heavier, carload lots, 1.80c. The warehouse price on Steel Bars is 1.90c. to 1.95c., and on Iron Bars, 1.95c. to 2c. Jobbers' prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.05c. Beams and Channels are 2.25c., base, out of stock. The warehouse price on Boiler Tubes, 2¾ to 5 in., is 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market shows no improvement, and prices, if anything, are a little weaker, although there are not enough transactions to establish a market price. Mills continue to buy from hand to mouth for immediate needs, and this demand is light, as nearly all the cousumers have enough coming in on contracts to supply their needs. The mills are looking for still lower prices and show no disposition to make new contracts at the present time. Dealers are doing little buying, and what purchases they are making are at very low prices. The Pennsylvania Railroad is out with a list of about 1000 tons of Scrap to be sold this week. A local bolt and nut maker reports the sale of a small lot of Turnings at $12.75 per net ton, Cleveland. All prices are largely nominal. We quote as follows per gross ton, f.o.b. Cleveland:

Old Steel Rails	$16.50 to $16.75
Old Iron Rails	22.00 to 22.50
Steel Car Axles	21.50 to 22.00
Old Car Wheels	23.00 to 24.00
Relaying Rails, 50 lb. and over	27.50 to 28.00
Relaying Rails, under 50 lb.	30.00 to 31.00
Heavy Melting Steel	16.00 to 16.50
Railroad Malleable	17.75 to 18.25
Agricultural Malleable	15.50
Light Bundled Sheet Scrap	13.50 to 14.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$26.00 to $27.00
Cast Borings	10.50 to 11.00
Iron and Steel Turnings and Drillings	12.00 to 12.50
Steel Axle Turnings	14.00 to 15.00
No. 1 Busheling	14.50 to 15.00
No. 1 Railroad Wrought	16.00 to 16.50
No. 1 Cast	18.00 to 19.00
Stove Plate	14.50 to 15.00
Bundled Tin Scrap	10.00

The Carpenter Steel Company, Reading, Pa., has opened a branch sales office at 1304 West Sixth street. G. B. Norcross is the local sales manager. The company will sell high speed Drill and Tool Steel.

Metal Market.

NEW YORK, September 4, 1907.

Pig Tin.—Business during the week has been light each day except Friday. Price changes are mixed, as follows:

	Cents.
August 28	37.35
August 29	36.65 to 36.75
August 30	36.15 to 36.35
August 31	36.25
September 3	36.75 to 36.85
September 4	37.12½

Business done on August 30 amounted to somewhat over 200 tons, and as the volume of business increased prices advanced. There was some talk of Tin being sold at 36c. by holders who desired cash, but this has not been confirmed. After the holiday on Monday there was a rapid recovery, prices advancing 50 points in this market against 30 points in the London market. Holders of Tin are disposed to await developments, as they believe that prices for the present have largely discounted the unfavorable features. The advance this afternoon confirms the belief that spot is growing scarcer. The statistics compiled by C. Mayer, of the New York Metal Exchange, show that the deliveries into consumption during August were good, amounting to 3200 tons. The total deliveries in this country for the first eight months of the year show a decrease of 550 tons, but the combined deliveries of Holland and London show an increase of 1779 tons, compared with the same time last year. The total visible supply at the end of August was 11,865 tons, a decrease of 975 tons, compared with the same date last year, and a decrease of 1200 tons, compared with the end of July. The stocks in the United States at the end of August showed practically no change from the month previous, being 1558 tons. The arrivals so far this month amount to 475 tons, and there are afloat for American ports 1415 tons. The London market closes firmer, at £168 5s. for spot, and £168 for futures.

Copper.—The announcement made in Europe September 2 by the United Metals Selling Company and Phelps, Dodge & Co., that they had reduced their price to 18c., brought little business there. On September 3 the American consumers of Copper were formally notified that they could secure metal from these interests at 18c., which, although not bringing in any volume of business, has cleared up the

situation considerably, for there were many skeptics in the Copper trade who did not believe that any quantity of the metal could be secured at lower figures than those established by the large interests some weeks ago, and there is reason to think that there will be more stability to the market. Conditions are better, for while Electrolytic could have been secured last week for American consumers at 17.75c., there were a number of inquiries in the market Tuesday and Wednesday morning at under 18c., and no business developed. It would, therefore, seem that the outside interests that have been cutting the price for weeks past have firmer ideas than formerly. Business in Europe, however, can be done at concessions, and we quote, for European delivery of Electrolytic, 17.50c. American consumers, however, have not been able to secure anything under 18c. since August 30, and an inquiry given to a number of dealers by steel interests in Pittsburgh brought out no lower quotation. Lake Copper is also relatively stiffer, and while slightly under 18c. could have been done during the latter part of last week there is now no Lake available at less than 18.12½c. Casting Coppers are practically neglected, but Copper of this grade can be had at from 17c. to 17.50c. A large buying movement is not expected at this time, as there are many in the trade who believe that some of the larger consuming interests have secured more Copper than they cared to tell of during the last six weeks, and there undoubtedly have been quiet sales going on at prices near those named by outside interests. Copper producers realize that a mistake was made when the price was allowed to go above 22c. The London market closes firm to-day, at £74 10s. for both spot and futures. Best selected is held at £82 10s. The imports of Copper are heavy, the total for July amounting to 13,600 tons, constituting a record for any one month.

Pig Lead.—The price of Lead is relatively firmer than a week ago, although there is little business of any consequence. Spot Lead cannot be had in New York at less than 5.20c., while shipments from the West are on a basis of 5.12½c. In St. Louis spot Lead is quoted at 4.95c. The American Smelting & Refining Company continues to accept orders only at the price current on date of shipment. Its price governing old contracts is 5.25c.

Spelter.—The price of Spelter is again easier and steps have been taken by producers to curtail the output. Spot lots can be had in New York at 5.50c. to 5.55c., and in St. Louis at 5.37½c. to 5.40c. London prices are again slightly easier than those of a week ago, at £21 10s.

Ferroalloys.—The price of 50 per cent. Ferrosilicon is stimulated at the moment, owing to the fact that a number of orders taken by an American works have not been filled; consequently the Steel mills have been compelled to enter the market and buy foreign Ferrosilicon. The price is unchanged, at $100, duty paid, for forwards, while spot is held at $104 to $105. Ferromanganese is unchanged, and future deliveries can be had at $56, Baltimore. Spot shipments continue firm, at $59 to $60.

Antimony.—The price is nominal and there is little or no business. Shipments of Cookson's can be had at 10.50c. and Hallett's for 9c.

Tin Plate.—There has been no change in the price of Tin Plate, but rumors are more or less persistent that there will be a revision some time during the next quarter, although Pittsburgh advices point to the maintenance of present prices. For 100-lb. I C Coke Plates $3.90 is quoted, f.o.b. Pittsburgh, and $4.09, f.o.b. New York.

Old Metals.—The price of Old Metals is practically unchanged from last week and dealers are taking on but small amounts. There has been considerable business in Old Metals from interests which formerly purchased Ingot Copper, but have been deterred from doing so recently owing to its relatively high price. This has kept the difference in price between Scrap and Ingot Metal smaller than formerly. Dealers' selling prices are quoted as follows:

	Cents.
Copper, Heavy Cut and Crucible	17.25 to 17.50
Copper, Heavy and Wire	16.75 to 17.00
Copper, Light and Bottoms	15.00 to 15.50
Heavy Machine Composition	14.50 to 15.00
Brass, Heavy	11.00 to 11.25
Brass, Light	9.00 to 9.50
Clean Brass Turnings	10.00 to 10.50
Composition Turnings	12.50 to 13.00
Lead, Heavy	4.75
Lead, Tea	4.37½
Zinc Scrap	4.62½

The Wheeling Mold & Foundry Company, Wheeling, W. Va., denies that it intends to purchase the property of the Poughkeepsie Iron Works at Poughkeepsie, N. Y.

The Wilkes Rolling Mill Company, Sharon, Pa., manufacturer of muck bar, has signed the Sons of Vulcan puddling scale.

New York.

NEW YORK, September 4, 1907.

Pig Iron.—While there have not been any sales of magnitude, it is evident that more interest is being taken in the market by buyers, which, on the whole, is steadier. We do not hear of further concessions in prices, and quote for large lots, early delivery, for Northern Irons, at tidewater, $21.25 to $21.75 for No. 1 Foundry, $19.75 to $20.50 for No. 2 Foundry and $19 to $19.50 for No. 2 Plain. Southern Iron is nominally $22.75 to $23.25 for No. 2.

Steel Rails.—The long awaited conference between engineering representatives of the railroads and of the Steel Rail manufacturers is now being held in New York, and will continue through Thursday. It is expected to determine some of the pending questions relating to methods of manufacture, quality of Steel and sections. In one case a railroad has adopted the sections of another line for its next year's order, but no general departures from sections heretofore rolled have been reported as yet, though it is known that some roads contemplate heavier Rails and a closer approximation of the amount of metal in the flange to that in the head. In the past week one interest has booked 10,000 tons for the Norfolk & Western, 3000 tons for the Kanawha & Michigan, 5000 tons for the Hocking Valley, 4000 tons for the Toledo & Ohio Central and 5000 tons scattering. Another mill reports booking 10,000 tons of Standard Sections in August, and that Light Rail business has held up to about 75 per cent. of the average of the past year. It is expected that by another month a very marked change will appear in the Rail situation, and that some large business for next year will come out.

Structural Material.—Reports agree that a good tonnage was turned out by the mills in August, and that while new business did not equal the shipments, it was of such proportions as to give no decided evidence of a shrinkage in construction. New railroad work is not plentiful, but there is much yet to come from the fabricating shops, most of which will be employed well into the winter. The American Bridge Company booked 53,000 tons in August, and probably more than that amount went to other companies. It was the best August total in the American Bridge Company's history, but the first eight months of 1907 did not show a total equal to that up to September 1, 1906. The largest architectural job now being figured on is a mercantile building in Pittsburgh, to be erected by the Oliver estate, and calling for 10,000 tons. The Steel for the approach to the Blackwell's Island bridge, 6000 tons, is soon to be let, and the New York Central is calling for bids for the suburban station and the baggage driveway roof at its terminal. About 2000 tons of Steel will be needed. At Houston, Texas, a commercial building, 2000 tons, is under negotiation, and more San Francisco work is coming up. Later in the fall a Mississippi bridge for trolley roads at St. Louis, about 6000 tons, will be figured on. Specifications for Structural Steel are keeping up well, according to mill reports, and cancellations in this line are rare. Steel car requirements have not shrunk, so far as current construction is concerned, and there is pending quite a good volume of orders, considering the money situation. We quote tidewater deliveries, mill shipments, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.90c.; Bulb Angles and Deck Beams, 2c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Sales out of stock, of material cut to length, are made at 2¼c. to 2½c.

Bars.—The movement of Bar Iron is light, but a little more inquiry is noted. Prices are continued on the basis of 1.60c. to 1.65c., Pittsburgh, or 1.76c. to 1.81c., tidewater, for Best Refined. Steel Bars are quoted at 1.60c., Pittsburgh, or 1.76c., tidewater, for deferred deliveries, while orders for early shipment still command a premium of $2 or more per ton.

Plates.—Small orders are fairly numerous. Quotations are firmly held as follows for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Market conditions are showing much improvement as far as the demand is concerned. Inquiries are much more numerous, and fair sales are being made. Manufacturers state that the volume of current business is now about normal, running, of course, considerably under what it was at the corresponding time last year, but the condition of affairs then prevailing was highly exceptional. The present demand is coming from consumers who must order now if they have any expectation of having Pipe laid this fall. Quite a number of small towns are in the market for lots running from 500 to 1000 tons. About 1000 tons is to be bought for improvements at Long Beach, L. I. Prices are quoted on the basis of $34 to $34.50 per net ton, at tidewater, on carload lots of 6-in.

Old Material.—While sales have been small, inquiries are becoming more general. This is noted particularly in Cast Scrap, Cast Borings, Wrought Turnings and throughout the cheaper grades. Offerings are light, as accumulations

do not seem to be burdening dealers; hence there is little disposition to force stock on the market. The trade appears to be patiently waiting for the revival in the demand, which is expected to come some time this month. Quotations, per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for melting	$14.00 to $14.50
Heavy Melting Steel Scrap	14.00 to 14.50
Old Steel Rails, rerolling lengths	16.50 to 17.00
Relaying Rails	26.00 to 26.50
Old Iron Rails	22.00 to 22.50
Standard Hammered Iron Car Axles	27.50 to 28.00
Old Steel Car Axles	19.50 to 20.00
No. 1 Railroad Wrought	17.50 to 18.50
Iron Track Scrap	15.50 to 16.00
No. 1 Yard Wrought, long	15.00 to 15.50
No. 1 Yard Wrought, short	14.50 to 15.00
Light Iron	9.00 to 9.50
Cast Borings	11.00 to 12.00
Wrought Turnings	13.00 to 13.50
Wrought Pipe	12.00 to 13.00
Old Car Wheels	22.50 to 23.00
No. 1 Heavy Cast, broken up	17.50 to 18.00
Stove Plate	14.50 to 15.00
Grate Bars	13.50 to 14.00
Malleable Cast	17.50 to 18.50

The Outlook for Canada's Pacific Province.

The Steel Projects.

TORONTO, August 31, 1907.—The North Pacific Iron & Steel Corporation, to whose plans for Vancouver works, as outlined by J. T. Shadforth, reference was recently made in this correspondence, proposes to adopt a profit sharing arrangement such as is established in some of the British iron and steel works. A preliminary not yet completed is the associating of certain British Columbia coal interests with the company, the object being to have within the corporation an abundant supply of all the needed varieties of raw material. Six influential men in Victoria are said to have joined with Mr. Shadforth in the undertaking, the promoter himself being an Englishman experienced in the iron trade. The first blast furnace is to have a daily capacity of 300 tons, and there are to be four 25-ton open hearth steel furnaces built at the same time, a blooming mill, a boiler plate mill, tin plate works, cast iron pipe foundry, iron tube works and a bar mill. Ship plate mills, rail mills and additional open hearth furnaces are for subsequent development.

C. P. Hill, who has in hand the other British Columbia iron and steel undertaking mentioned in a former issue, likewise aims at joining coal and iron properties in a big system, but as was there pointed out the works are for the interior of the province, Kootenay Landing being the spot decided upon. From the coal mines of Mr. Hill's company—the Hillcrest Coal & Coke Company—shipments are now being made to the Canadian Pacific Railway Company, from whose Crow's Nest Pass line a spur of 2½ miles in length runs to the company's mine.

It is announced that James A. Moore, a Seattle man, is preparing to erect a blast furnace on Burrand Inlet, at a point not far from the city of Vancouver. He and his associates control iron ore deposits on Texada Island.

The Dominion Deputy Minister of Mines.

A. P. Low, Deputy Minister of Mines for the Dominion, is on a tour of inspection to ascertain in what way the new department of which he has been made the deputy head can best promote the mining and metallurgical interests of the country. He is at present in British Columbia, in the southern portion of which province several officials of the Geological Survey, of which Mr. Low is still the director, are at work. In an interview, published in the *Times* of Victoria, B. C., Mr. Low spoke of the magnetometric survey of the iron deposits of Vancouver Island, now being carried out. Should this survey furnish satisfactory evidence of the adequate iron ore supply and of abundance of good coking coal, the widest publicity will be given to the report by the Mines Department, whose aim it will be to attract to the resources in question the attention of capitalists interested in the iron and steel industry. Concerning the outlook in British Columbia, Mr. Low is reported to have spoken as follows:

I have no hesitation in saying that British Columbia is the most richly mineralized province in the Dominion. Its mining industry, despite various setbacks, has developed at a marvelous rate during the past eight years, but great as this expansion has been, it will be nothing compared to the gigantic strides in the near future. It is quite safe to predict that within 10 years at the latest the Pacific Coast will be the home of a well established iron and steel industry. Here you have the ideal conditions—as iron and coal exist in close proximity.

H. R. Hedley, formerly of the Hall Mines Smelting & Refining Company, Nelson, B. C., is collecting information in the province for the authoritative work on Canada's mineral resources that the department is preparing.

Geological Survey's Work.

Of the work of the Geological Survey in British Columbia Mr. Low had this to say:

The work in certain portions of the Kootenays and other sections of southern British Columbia has been completed; and in time it is expected that similar maps showing the geological conditions in every portion of British Columbia will be available for the prospector and capitalist. The maps are issued in two sizes, each sheet indicating areas 48 by 72 miles, and the other 96 by 144 miles.

Messrs. Bancroft and Graham, of my official staff, are engaged this season studying the areas of mineralization and examining claims in a region embracing a section of country on the Mainland north of Howe Sound and Texada Island, and a portion of Vancouver Island. Structural geology and every other feature will be dealt with in the reports and map sheets to be issued next year.

J. W. W. Leech is mapping out and examining the new copper and coal areas in the vast region comprising the upper Skenna, the Telqua Valley, &c., thus bringing to completion the work he undertook last year. This map will also be available next winter.

Messrs. McConnell and McLaren are also continuing their field work in the Yukon in the White Horse copper belt, and the silver-lead region about Conrad City, just north of the British Columbia boundary line.

Mr. Cairns is further down the Yukon River, below White Horse, examining the coal seams which outcrop principally along the west bank. This coal field is now known to be 100 miles long, and as some of the coal is available for coking purposes it is certain that the problem of cheap smelting of the copper and lead ores in the Yukon will be solved on the spot.

The department has 30 parties engaged in field work this summer. They are scattered all over the Dominion.

The Coke Shortage.

R. F. Tolmie, Deputy Minister of Mines for British Columbia, is investigating the causes of the coke shortage which has brought to a standstill operations at most of the metallurgical works in the province. C. A. C. J.

Iron and Industrial Stocks.

NEW YORK, September 4, 1907.

The past week has witnessed a continuous recovery of prices. The developments of the week have all been of a decidedly favorable character, and consequently prices of securities have steadily hardened. The change in sentiment is remarkable when it is considered that such a short time ago the public was being induced to believe that the foundations of all values had been shattered. As Saturday and Monday were holidays, the transactions of the week were smaller than usual. The range of prices on active industrial stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 30⅞ to 32⅜, preferred 94⅛ to 95¾; Car & Foundry common 38¼ to 39¾; Locomotive common 52 to 54½; Colorado Fuel 24 to 25¾; Pressed Steel common 27½ to 29½, preferred 84½ to 85; Railway Spring common 36 to 37; Republic common 19½ to 21⅞, preferred 71¾ to 73¼; Sloss-Sheffield common 46¼ to 47½; Cast Iron Pipe common 29 to 32, preferred 76 to 78; Can preferred 46½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 31⅝, preferred 94⅞; Car & Foundry common 39¼, preferred 95⅛; Locomotive common 53¼, preferred 100; Steel Foundries common 6¼, preferred 33; Colorado Fuel 24½; Pressed Steel common 29, preferred 85; Railway Spring common 36½; Republic common 21⅛, preferred 73¼; Sloss-Sheffield common 47¾; Tennessee Coal 135; Cast Iron Pipe common 31⅜, preferred 77½; Can common 4¾, preferred 48.

Dividends.—The American Can Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 1.

The International Silver Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable October 1.

Upon the petition of the Northern Coal Company, L. C. Petitt, of Big Stone Gap, Va., has been appointed receiver for the Union Iron & Steel Company, operating blast furnaces in that locality.

Trade Publications

Machinery.—Wickes Brothers, Saginaw, Mich. Monthly stock list. The issue of August 15, 1907, supersedes all others and lists the company's stock of boilers, engines, dynamos, motors and miscellaneous machinery.

Drill Rods and Steel Tubing.—Edgar T. Ward & Sons, 23 Purchase street, Boston, Mass. Pamphlets. One gives sizes and prices of Capital high speed polished drill rods, and the other gives sizes and prices of cold drawn seamless steel tubing of round, square and rectangular shapes and tables of standard gauges, weights of solid round bars, decimal equivalents, and comparisons of sizes and nearest sizes of high grade seamless cold drawn steel tubing.

Bolt Cutters.—Standard Machinery Company, Bowling Green, Ohio. Loose leaf catalogue. Pertains to the company's line of standard ¾ to 4 in. single bolt cutters, and the standard 1½ and 2 in. double bolt cutters, giving illustrations, dimensions and prices.

Concrete Pipe.—Reinforced Concrete Pipe Company, Citizens' National Bank Building, Los Angeles, Cal. Catalogue. Deals with reinforced concrete pipe for sewers, conduits, railroad culverts, &c., for which many advantages are claimed. Illustrations are given of sections of the pipe, the iron reinforcement used, and several pieces of pipe connected, showing the method of jointing. Views of installations and some testimonials letters are included. Reinforced concrete catch basins and man holes are also dealt with.

Ice Machine Fittings and Supplies.—Triumph Ice Machine Company, 610 Baymiller street, Cincinnati, Ohio. Catalogue and bulletins. Catalogue D is 6 x 9 in., with 81 pages, and is intended to briefly illustrate and describe the company's steel ammonia fittings and ice factory supplies, pointing out the methods employed in their design, the material used in construction and the economy obtained by their use. The supplies listed include ammonia globe, angle, expansion, check, charging and blow-off valves, cocks, strainers, crosses, tees, elbows, flanges, gaskets, bushings, return bends, tanks, cranes, &c. Several testimonials and an index to code words are included. Three bulletins, numbered A1, A2 and A3, pertain, respectively, to ammonia condensers, steam condensers and steel valves and fittings. The company's pamphlet called "The Argument" gives information concerning its Triumph compressor and atmospheric ammonia condenser.

Pumps.—Allentown Rolling Mills, Allentown, Pa. Pump data bulletins. No. 13 concerns the Aldrich vertical triplex electric pump of solid water end pattern, designed for medium capacities and lifts, and gives an extensive table of its range of operation. No. 14 deals with a similar pump but having a divided water end, being intended for large capacities and low lifts. It also illustrates the Aldrich quintuplex electric pump in both vertical and horizontal patterns.

Electric Motors and Lamps.—Fort Wayne Electric Works, Fort Wayne, Ind. Bulletins. No. 1086, superseding No. 1026, gives an elaborate illustrated account of direct current series inclosed arc lamps of the differential type, form C. No. 1091, superseding No. 1036, similarly treats of direct current motors, type EF: No. 1092, superseding No. 1072, of type S single-phase motors, and No. 1093, superseding No. 1071, of small power motors, types GA and GD.

Gas and Gasoline Engines.—C. H. A. Dissinger & Bro. Company, Wrightsville, Pa. Catalogue A. Illustrates and describes the Capital gas and gasoline engines, which are made in sizes from 2½ to 200 hp. It is described as the only engine without packing. A unique method is adopted for emphasizing the good features of the engine by pointing out constructions in igniter and valve mechanisms which are bad practice and are not to be found in this engine. The engines are furnished for stationary, semiportable and portable use.

Foundry Equipment.—J. W. Paxson Company, Philadelphia, Pa. Bulletin No. 15. Illustrations, brief descriptions and prices are given of a few of the company's products, these including pan grinders, fret mills, tumbling barrels, ash grinders and metal separators, ladles, sand sifters and mixers, pugging mills, channel iron flasks, centrifugal sand mixers, ball mills and pneumatic suction cleaners (sand lifters).

Sensitive Drills.—Wm. Gardam & Son, Inc., 45 Rose street, New York. Bulletins. No. 2 illustrates the five smaller sizes of Gardam sensitive drill presses, these drilling ¼ and 5-16 in. holes, and No. 14, six larger sizes, drilling ½-in. holes and being made with one, two, three, four and six spindles.

Gas and Gasoline Engines.—Jacobson Machine Mfg. Company, Warren, Pa. Engineers' handbook. In a review of this given in *The Iron Age* August 15, 1907, a typographical error occurred in the last sentence, which should have read as follows: "Some 22 pages of miscellaneous useful information, a telegraph code, list of parts of engines and a complete index are appended."

Turbine Pumps.—Henry R. Worthington, 114 Liberty street, New York. Catalogue No. W-159. Size 6 x 9 in.; pages 34. Illustrates and describes Worthington turbine pumps of horizontal and vertical types and of numerous sizes. The general principles, design, adaptability, methods of arrangement, installation, starting, and the various parts of the pumps are described, and information pertaining to the selection of pumps is given.

Stone Working Machinery.—F. R. Patch Mfg. Company, Rutland, Vt. Catalogue F. Gives an illustrated description of special machinery for working and finishing stone, including planers, diamond saws, gang saws, rip saws, sand pumps, saw punches, hauling towers, transfer cars, rubbing beds, rubbing bed cranes and devices, tile machinery, polishing machines, drills, globe stoves, oval hole and mosaic machines, floor surfacers, lifting jacks, slate and soapstone machinery, derricks, hoists, waste boxes, turning engine, traveling cranes, and an industrial railway system. Some tables of useful information are included.

Bonuses to Officers of the American Steel Foundries.

A contest has been in progress recently for proxies to be used in the annual meeting of the American Steel Foundries in October. Some of the statements in the controversy between the New York banking firm of Swartwout & Appenzellar and the officers of the company throw light upon an arrangement by which the officers receive large sums from the earnings of the company in times of prosperity. A circular sent by the banking firm to the stockholders says: "Four of the officers of the company, including the president, have a contract which has still three years to run, under which they receive in addition to salary a bonus based on the earnings of the company, under which when net earnings amount to $2,500,000 (as will probably be the case this year) their bonus amounts to $451,666."

President William V. Kelley has sent a communication to the stockholders of the company saying that the company has made no public reports either for the whole fiscal year ending July 31 or for any part of it, and that the earnings, as given in the circular of the banking firm, are largely overstated. As to the bonus arrangement President Kelley says:

> It is not now, and never has been, a secret that the writer and three of his associates have an arrangement to share in the profits, under certain conditions and within certain limits. Such share, however, does not begin until after a large amount has been earned for the company, and ends when the amount reaches a certain maximum, which, in the fiscal year just ended, was reached several months before its close. The contract covering the arrangement was authorized by the Board of Directors and submitted to and approved by it before execution, and was subsequently ratified by the stockholders, it together with other items to be acted upon by the stockholders being specifically mentioned, both in the notice of the meeting and the form of proxy mailed to each stockholder entitled to vote, the notice further stating that the contract was subject to inspection by any stockholder at the office of the secretary.

Replying to the president's communication the banking firm says that the figures it has used as a basis for its estimate of the net earnings are those published each month in the financial papers, and purporting to be those submitted at the monthly meetings of the Board of Directors. The firm adds:

> Our own circular estimated that the net earnings for the year would be in excess of $2,500,000, which is the amount fixed by the five year contract as the maximum for Mr. Kelley's bonus percentage, and that this amount was earned Mr. Kelley himself states in the fourth paragraph of his circular, when, referring to the contract, he states that his bonus ends when the amount earned "reaches a certain maximum which in the fiscal year just ended was reached several months before its close."
>
> Mr. Kelley states that the officers' bonus contract was submitted to the Board of Directors and subsequently ratified by the stockholders. Our information regarding this is to the effect that the ratification by the stockholders was by vote of the officers holding their proxies—that only one stockholder attended the meeting, and that he voted against it.

The beginning of the controversy was the agitation of the stockholders for a resumption of dividends on the preferred stock, on which nothing has been paid since August, 1904.

The John A. Roebling's Sons Company is building a new wire mill, cleaning house, annealing house, galvanizing shop, tempering shop, machine shop, blacksmith shop, warehouses, and a number of additional dwellings at its new industrial village at Roebling, N. J., on the Delaware River, 10 miles below Trenton.

The Machinery Trade.

NEW YORK, September 4, 1907.

The week's business in the machinery trade was affected somewhat by the holiday, and several houses reported a slight falling off in sales which was largely attributed to the fact that many people were out of town from Friday until Tuesday. An optimistic feeling prevails, however, and it is generally thought that with the ending of the vacation season business will resume its former healthy condition. The railroads continue to do some scattered buying. The Lehigh Railroad is placing some business in the trade for its shops at Sayre, Pa., and the Boston & Albany is buying for its new Springfield shops. Of the inquiries in the trade, a large majority look like solid business. There is a fair demand for second-hand machinery, which is largely due to the fact that many smaller manufacturers in making their fall inventories have decided to make additions to their manufacturing facilities.

The Executive Committee of the National Machine Tool Builders' Association has just concluded and perfected arrangements for the next annual convention, which will be held in New York, Tuesday and Wednesday, October 15 and 16. The Hotel Imperial, Broadway and Thirty-second street, has been selected as headquarters.

Gas Engine Manufacturers Organize.

A number of firms manufacturing gas engines have formed an organization known as the United Gas Engine Builders for the purpose of furthering the interests of gas engine manufacturers in this country. The officers of the association are F. H. Stillman, of the Bridgeport Motor Company, president; J. G. Erd, Erd Motor Company, vice-president; James E. Baldwin, Art Machine Company, secretary-treasurer. The directors are the officers and Thomas J. Barber, of Barber Brothers; Frank P. Conrad, Lackawanna Mfg. Company; W. J. Graham, Rochester Gas Engine Company. The purposes of the organization are set forth in the first paragraph of the charter, as follows: To promote the interests of gas engine manufacturers and dealers, and of any allied and kindred business and interests; to produce, publish, purchase, and disseminate literature and information generally for the promotion, protection and general welfare of such manufacturers and dealers, and of such allied and kindred business and interests; to conduct and cause to be conducted, experiments and investigations of mechanical and other devices, patents, inventions, processes and formulæ, and to publish and issue information in reference thereto or otherwise disseminate the results thereof, to those engaged in the business hereinbefore referred to.

Plans are under way for the establishment of a large shipbuilding plant at Norfolk, Va., by a Philadelphia syndicate, headed by Edward S. Cramp. The syndicate has secured about 26 acres of ground, with 1000 ft. of water front, across the eastern branch of the Elizabeth River, just opposite the Norfolk & Western Railroad station, and upon this property it is expected a plant to cost over $1,000,000 will be erected. As it is the intention to construct large ships, there will be required a large amount of machinery for equipping the yards. The project is at the present time only in an initial stage, but it is likely that in the course of a month or so plans will be in shape so that the particulars can be made public. Mr. Cramp is well known in the shipbuilding trade on account of his former connection with the William Cramp & Sons Shipbuilding Company, Philadelphia, and with him is associated George W. Norris, also of Philadelphia.

A few of the railroads have come into the market the past few days for additional machinery, among which is the Central Railroad of New Jersey. This road has sent out fair sized preliminary inquiries for power equipment.

The New York Central Railroad has taken out a permit for the construction of a brick repair shop, 43 x 250 ft., at the Mott Haven yards, to cost about $20,000.

The New York & Queens County Railway Company has purchased about four acres of property on the Flushing meadows for the purpose of erecting a large car house and shops, for which plans are now under way. As yet nothing has been heard in this district about machinery equipment, and it is presumed it has not been purchased. The land was bought from the Degnon Contracting Company, which is developing a large section of meadow land, to be sold for industrial building sites.

The annual report of the American Locomotive Company, New York, issued a few days ago, is of considerable interest to the machinery trade in that it states that the company intends to still further increase the capacity and efficiency of its plants at Schenectady, N. Y.; Dunkirk, N. Y.; Richmond, Va., and Montreal, Canada. The capacities of these plants were largely increased the past year, and for the coming year the company has again created an extraordinary addition and betterment fund of $2,000,000.

Fire destroyed a large part of the shop equipment in the bridge plant of Snare & Triest, Jersey City, last Friday night. It is understood that the firm will probably rebuild, and will undoubtedly need some equipment to take the place of that which was ruined by the flames.

From all accounts the Carnegie Steel Company has not as yet come into the market for machine tools for the large warehouse in course of construction in the Waverley section of Newark, N. J. The company expects to do some steel fabricating and cutting to size in the plant and probably needs some shears, shapers and the like. It is understood that a power plant of about 150 kw. and about 1000 hp. of boilers will be used, which, it is thought, has been arranged for. When the plant is completed it will be used as a storage warehouse and distributing center for the Manhattan and Jersey City territories.

The Southwestern Portland Cement Company, El Paso, Texas, has prepared plans for the construction of a plant which will cost about $1,000,000. A complete line of cement manufacturing machinery will be required, and the Cement Engineering Company, Los Angeles, Cal., Aman Moore, general manager, which will superintend the construction of the plant, will secure the prices on the machinery.

The Panama Portland Cement & Development Company, Batavia, N. Y., expects to engage an engineer within the next few weeks and proceed with the construction of its large cement plant. C. C. Godfrey is secretary.

Duquesne Light and Power Plant.

A large amount of power plant equipment will soon be purchased by the Duquesne Light Company, of which Robert C. Hall, Pittsburgh, Pa., is the chief owner, for equipping its proposed new plant. The details have not been worked out as yet, and it is not known at this time just what equipment the company will require, but we understand that within the next month or so the company will be ready to take up the matter of equipment. A mortgage has been executed to the Fidelity Title & Trust Company for $10,000,000 to secure bonds for that amount to raise the money to build the plant and carry out the company's plans. Four acres of ground along the Monongahela River on Second avenue have been purchased, upon which the company will erect a modern electric light and power plant, to cost about $1,500,000. Work on the plant will be begun as soon as possible, and it is hoped that the plant will be equipped so that the company can make contracts for lighting the city next year.

The Babylon Electric Light Company, Babylon, L. I., has inquiries out for equipment for a power house, 45 x 110 ft., which is to cost $30,000. It is understood that the company will shortly award a contract for the erection of the structure, and the machinery orders will be placed soon.

The Sayer & Fisher Company, Sayerville, N. J., is purchasing machinery equipment for a power plant exteynsion. The company has bought a 24 x 44 x 48 in. cross compound engine from the Fitchburg Engine Company, and is now in the market for power transmitting machinery. The company manufactures brick.

James M. Seymour, 51 Lawrence street, Newark, N. J., has been awarded a contract to furnish a lighting plant for the Newark City Hall, at a cost of $28,904, and he will probably soon purchase the necessary machinery equipment.

A. R. Wolfe, 130 Fulton street, New York, is purchasing equipment for a 800-hp. plant for the Union Theological Seminary, to be erected at 120th street, New York. The plant will consist of a battery of four boilers and engines to match.

Additional contracts for work on the Erie Barge Canal have been awarded, involving an expenditure of more than $3,000,000. Contract No. 35 has been awarded to the Gilmour-Horton-Allan Company, Sandy Hill, N. Y., for $739,361. The company has not yet determined just what equipment it will require for doing the work, but it will use two crushers, two concrete mixers, one steam shovel, a tug and three scows, derricks, hoists and four drills.

Business Changes.

The Riverside Engine Company, Oil City, Pa., builder of the Riverside heavy duty gas engine and gas driven air and gas compressors, is strengthening its sales department by establishing a number of sales agencies. L. B. Lent, formerly of the Wile Power Gas Company, will have charge of the New York office, at 26 Cortlandt street. The Pittsburgh office, at 710 Empire Building, will be in charge of the N. C. Davison Company. The W. E. Austin Company, with headquarters in the Candler Building, Atlanta, Ga., is looking after this line in the Southern territory. Arrangements will shortly be made for sales agencies covering the Western territory.

Chicago Machinery Market.

CHICAGO, ILL., September 3, 1907.

Having settled down to a gait that in comparison with the rushing pace at which trade in machine tools was driving during the earlier months of the year seems aggravatingly slow, business cannot, when measured by general averages, be considered unsatisfactory. The unrealized expectations aroused by the appearance some months ago of a number of large tool specifications, most of which were subsequently withdrawn, or at least were never purchased, were naturally disappointing; but in their stead there has been a continued general demand, which, though not productive of a large volume of business, constitutes a very desirable class of trade. Tool orders at the present time represent mainly the requirements of established shops and factories for additional machines, there being fewer new plant equipments of important size included in current transactions. The latter are, however, not wholly lacking, even if they are a less conspicuous factor than heretofore. Several fair sized orders of this character are now in hand, and others in prospect promise material additions to market activity before the close of the year. It cannot be doubted that the inability of dealers and makers to supply machines of representative class within reasonable time continues to retard buying. Absolute needs often compel users reluctantly to accept substitution. Citing an instance of this, a buyer in a large machinery plant explained that wishing to supplement his equipment with a lathe similar to one then satisfactorily in operation, he found it could not be supplied inside of four months, and in consequence a tool of different make was selected. Under these circumstances it can scarcely be doubted that in many shops tools are being unwillingly continued in use that would be replaced with new ones if they could be secured with any reasonable degree of promptness. Slowly, however, conditions in this respect are improving; yet when confronted with the fact that a number of very desirable tools are sold ahead for from six months to a year, it is needless to expect a complete restoration of normal deliveries for a long time to come. Railroads continue to buy very sparingly. Requisitions in this, as in all other departments, are very carefully pruned, as is fully attested by the meager lists that from time to time appear in the market. Although some fair sized orders have recently emanated from Western automobile interests, the outlook for future trade from this source is not especially promising. At the same time makers of cheap and medium grade motors seem in some instances to find the demand strong enough to warrant an extension of their output.

Important as it is as a distributing center for machine tools, Chicago has been almost wholly without representation in the manufacture of this class of machinery. Lack of skilled mechanics familiar with the work and unstable labor conditions are assigned as the chief reasons for the absence of interest heretofore shown in this industry. It is therefore worthy of note that a start in this direction, modest in extent though it be, has at length been made. The Smurr & Kamen Machine Company, 97-101 South Clinton street, having embarked in the business of tool building, has recently put on the market a new 14-in. engine lathe, designated as the Illinois. The sale of this tool is in the hands of McDowell, Stocker & Co., who have been appointed exclusive selling agents. A plain and friction head turret lathe and a screw machine of similar design are built by the same company. These are exclusively handled by the A. D. White Machinery Company. Certain other machinery builders have developed an interest in the same direction, and it is not at all unlikely that in the near future impetus to the manufacture of machine tools in Chicago will be given by the entrance of other makers into the field.

The Chicago, Rock Island & Pacific Railroad is asking for prices on a small list of tools that fairly represents the conservative requirements of the railroads at the present time. The tools wanted are as follows: One 28-in. shaper, one 18-in. lathe, one 14-in. lathe, one 36-in. drill press, two bolt cutters and one safety grinder.

The Reliable Dayton Motor Company, 375 West Lake street, Chicago, automobile manufacturer, finding its present quarters and facilities entirely inadequate to meet the demands of a rapidly increasing business, has secured a site at Thirty-seventh street and Ashland avenue, and is planning the erection thereon of a factory building 50 x 250 ft. Work on this improvement only awaits the completion of plans, which will not be long delayed. Besides boilers and engines and motive power machinery, a considerable amount of new equipment in the way of machine tools will be needed to bring the capacity of the plant up to present requirements.

An important addition to the steel making industries of the Northern Pacific Coast is the recently organized Cascade Steel Foundry Company, incorporated with a capital stock of $200,000 for the purpose of establishing an open hearth steel furnace and foundry at Seattle, Wash. A site of 20 acres has been secured for the erection of the plant at Earlington, about 10 miles south of the city, where it is proposed to build a 10-ton open hearth furnace, with a daily capacity of 30 tons. A steel foundry large enough to use this product will also be built and equipped with modern machinery and appliances. It is stated that pig iron imported from Europe, and to some extent from China, is brought over as ballast in English, German and Belgian vessels engaged in the wheat and lumber carrying trade, and laid down in the local market at a cost but little in excess of that current in Eastern steel making centers. The new plant, it is expected, will be completed and ready for operation by January 1, 1908. The officers of the company are Maurice D. Leehey, president; James F. McElroy, vice-president; Alfred W. Henry, general manager.

The Raymond Lead Company, Chicago, maker of lead pipe and sheet lead, is arranging for the construction of a new plant to accommodate its expanding business. Plans are being prepared by Treat & Alschuler, architects, for the erection of buildings which will cover the new site, 125 x 536 ft., located on Lexington street, between Washtenaw avenue and the Chicago & Northwestern and Panhandle tracks. The three principal structures will consist of a power house and sheet lead mill, 125 x 175 ft.; storage house, 18 x 139 ft., and a building 113 x 224 ft. for offices and the lead press machinery, all of which will be two stories and will be of fireproof mill and steel construction. Just what will be required in the way of new equipment has not been determined, but the plant is designed to be up to date and will doubtless be supplied with modern machinery. As soon as plans are complete the work of construction will be immediately begun.

The Marinette Iron Mfg. Company, Marinette, Wis., is beginning the manufacture on a large scale of gas engines. It has just started work on 100 new engines to meet orders that are constantly being received. Among the orders received recently is one for a 20-hp. engine to go to Holland. Twenty-five machinists and molders have been added to the working force of the plant.

The consolidation of five important Indiana and Michigan electric power companies under the corporate name of Indiana & Michigan Electric Company, South Bend, Ind., is announced. The interests merged in the new company, which is incorporated with a capital stock of $2,000,000, includes the South Bend Electric Company, South Bend, Ind.; Buchanan Company, Buchanan, Mich.; Elkhart Electric Company, Elkhart, Ind.; St. Joseph & Elkhart Power Company, South Bend, Ind.; Berrien Springs Power & Electric Company, Berrien Springs, Mich. Power for the generation of current used in this system of plants is furnished from hydraulic stations on the St. Joe River. It is stated that the company is preparing to expend a large amount of money in developing and extending its hydraulic power sources and equipment.

Plans are in course of preparation for the construction of a hydraulic water power plant for the Sioux Falls Light & Power Company, Sioux Falls, S. D. This work, which is under the supervision of H. M. Byllesby & Co., Inc., consulting engineers, Chicago, includes the building of a 700-ft. dam of reinforced concrete construction across the Big Sioux River at Sioux Falls, which will supply a 72-ft. head pressure. It is designed to develop 3000 hp. from this station, which will be used for the generation of electric current for electric and power purposes. Contracts for the turbine wheels and other necessary equipment have not yet been placed.

Proposals will be received until September 10 by the Board of Public Service of Troy, Ohio, on steam, oil and gas producer engines for use in the electric light plant. Communications respecting plans and specifications of this work should be addressed to L. A. Ziegenfelder, clerk.

Among the interurban railroad construction enterprises proposed, of which there are many engaging the attention of promoters throughout the West, one which contemplates the building of approximately 50 miles of road to connect the cities of Little Rock and Pine Bluff, Ark., is now reported to be ready to receive figures on construction work and material. This line is known as the Little Rock & Pine Bluff Traction Company, and is incorporated with a capital stock of $100,000. It is stated by the president of the company that figures are desired on grading in sections, track laying, bridges, overhead construction and power house. Bids will be received on this work either in part or as a whole. The company is also in readiness to receive prices from manufacturers or supply houses on wire, steel bridge material, overhead construction material, power house equipment and cars. General offices of the company are at 501½ Main street, Little Rock, Ark., and its officers are J. J. Fiske, president and general manager; W. H. Lankford, vice-president; J. W. M. Rose, secretary and treasurer.

Cincinnati Machinery Market.

CINCINNATI, OHIO, September 3, 1907.

Although at the very turning point—the rounding of summer dullness into fall activity—the time when manufacturers begin instinctively to brush up business-bringing features of office paraphernalia and post up on general trade conditions of the country looking to possible new business, Cincinnati machinery manufacturers evidence little anxiety, for the best possible reasons, as one large manufacturer of machine tools puts it, "that we are all booked up to our capacity for months to come."

And while this is true, still it must not be overlooked that orders are not plenty nor of great volume from the cost viewpoint. The sales agents report some inquiry and some sales of the better class of tools, with a slightly increasing demand for second-hand tools. A few dealers are inclined to feel that the recent automobile failures have exercised a depressing effect on the market. The sharp competition between the various branches of the tobacco manufacturers produced good business for those making tobacco manufacturing machinery, and one of these reports its establishment still running a three-night per week shift.

There is an increased demand for milling machines, and the large establishments here making that type of machine report excellent business. Taking the entire range of tool products into consideration, the situation seems to suggest a feeling that while domestic orders still hold back, there is enough foreign business booked and still to come to keep every manufacturer on full time, and therefore he need pay little heed to present trade developments. Next Monday, September 9, a number of the local establishments will begin working on overtime, in line with a custom of recent years.

Deliveries of machine tools continue to improve slowly, and where it was practically impossible a few months ago to guarantee any kind of reasonable delivery, some companies manufacturing special tools are able to make practically immediate delivery.

An important announcement is made in connection with the enlargement and expansion of the business of the Andrews Steel Company, Newport, Ky. The capital stock has been increased from $500,000 to $750,000, and bonds have been issued bearing date of October 1, 1907, to mature October, 1922, the company reserving the right to redeem such of the bonds as it sees fit at the end of five years or at any interest paying period thereafter by paying a premium of 5 per cent. The bonds bear interest at 6 per cent. The company expects to begin the manufacture of forging billets, ordinary rolling billets and sheet steel bars about the first of the year, with a capacity of 300 to 400 tons per day. The statement is made by a member of the company that it was forced to erect its own steel plant because of trouble experienced in securing steel billets, &c., from its usual sources of supply. The new establishment, which will be located on the Licking pike, will supply all the material needed by the Newport Rolling Mills, also owned by the Messrs. Andrews. The company expects to market some of its steel product.

The Manufacturers' Club outing, which was scheduled for last Saturday, has been postponed again, on account of the slow return of the members from their vacations. The affair will probably be given next Saturday.

The National Biscuit Company's Cincinnati interests, which are very large, will be transferred soon to the company's own property to be acquired, the negotiations now being conducted in the New York offices. The refusal of owners of two buildings which the company has been renting to renew the leases after November 1 is responsible. It is understood that the company will be in the market for additional boiler and engine equipment.

The Troy Foundry & Engine Company, Troy, Ohio, is in temporary distress through the filing of a suit for receiver and an accounting by creditors. Judge Thompson of the United States District Court appointed H. Black receiver.

Optimistic reports of conditions in South American countries, as seen from the viewpoint of woodworking machinery manufacturers, are given by A. W. Feuss of the J. A. Fay & Egan Company, who has just returned from a three years' trip through the lower American States and colonies.

An enterprise of the Ohio Coal & Iron Company, with yards at Fifth street and Wayne avenue, Dayton, Ohio, has just assumed working form in the incorporation by Edward B. Wright, W. F. Grimes, C. H. Jaegar, H. O. Symmes and F. A. Hunt of the Dayton Terminal Company. Mr. Wright is president of the Ohio Coal & Iron Company and largely interested in the Ohio Foundry Company, Dayton, Ohio.

J. A. Steltenkamp, the recruiting agent for the contractors on the Panama Canal, is in Cincinnati securing machinists for the canal work. Mr. Steltenkamp pays the machinists of this section a compliment in his statement that he "finds that Cincinnati is the best town in America for first-class machinists." He has signed nearly 100 men here, and says that Cincinnati has furnished more machinists than any other city.

It is denied from Findlay, Ohio, that the Findlay Foundry & Machine Company is to wind up its affairs and quit. The statement is made that while the affairs of the old company will be wound up, an entirely new company is to be formed to operate and enlarge the business. F. W. Mussetter of Fostoria is the receiver.

The Niles Corrugating Company, Niles, Ohio, has increased its capital stock from $50,000 to $100,000.

Work of installing the machinery for the Tiffin Malleable Chain & Iron Works, Tiffin, Ohio, will soon begin. The company expects to be in operation by January 1. T. K. Webster of New York is the secretary of the company. Others interested are L. H. Webster, William Klumpp and H. C. Rosmes of Chicago.

The Central Brass & Fixture Company is a new incorporation at Springfield, Ohio.

Cleveland Machinery Market.

CLEVELAND, OHIO, September 3, 1907.

The local machine tool market continues inactive. The sales during the past week have been mostly of single tools, and the aggregate business done was about the same as during the previous weeks of the month. While the August business was light, it fully equaled the expectations of the dealers, who looked for a quiet month after a very satisfactory business in July. The August volume of business aggregated about the same as during the corresponding month a year ago.

Machine tool dealers are looking for more active buying during the present month. Inquiries are coming in very satisfactorily, and there is a general feeling among manufacturers that business will continue good during the coming year. It is the scarcity of money rather than a fear that business will show a serious falling off that is causing manufacturers to delay in placing orders for machine tools for additional plant equipment. In view of the financial stringency, managers of industrial plants are not disposed to tie themselves up with contracts for machinery when there is the possibility that they will have difficulty in making loans should it be necessary for them to do so when the payments become due. The financial situation is also having the effect of delaying for the time being the starting of a number of new projects which have been incorporated, and which are now waiting for a more favorable time to secure capital.

Dealers have a larger stock of machine tools on hand than they did a few weeks ago, but not a great deal of improvement is noted in deliveries, except in lathes, and very often sales are lost because the prospective purchaser is unable to secure prompt shipment.

Machinery manufacturers and those engaged in other lines of the iron and steel industry are as busy as ever and, as a rule, have enough orders to keep their plants running the rest of the year, and a few of them far into next year, but new orders are not coming in as heavily as they were a few months ago. While there are some cancellations of orders for machine tools, cancellations are no more frequent than usual.

Foundries in this territory report that they have plenty of work on hand to keep their plants running full, but they are not rushed as they were and can make prompt deliveries.

The shipbuilding industry on the Great Lakes is in a very satisfactory condition. The leading lake shipbuilding company now has 28 lake freighters under contract for delivery between now and next spring, about half the contracts being closed during the past two months. This company has more men employed than a year ago, and has enough work on hand to keep it busy until well along into next spring. The orders for new boats placed this summer about equal in number those placed up to September 1 in 1906, which was a record breaking year in the lake shipbuilding industry. There are now inquiries pending for about 10 additional lake freighters for the spring of 1908 delivery, and it is expected that orders for some of these boats will be placed shortly, although the financial stringency is again felt here, in that it is causing difficulty in securing capital for boat building projects.

The Cleveland Twist Drill Company has purchased the business, stock, raw material, patents and good will of the Three Rivers Tool Company, Three Rivers, Mich. The machinery will be moved to and immediately installed at the works of the Cleveland Twist Drill Company, Cleveland, and the manufacturing resumed with as little interruption as possible. While there will naturally be some delay in getting things in running order, still with the assistance of J. G. Matthews, former manager of the Three Rivers plant, who will have charge of the Peerless department, the company hopes to begin finishing up old orders very soon and be prepared for new work. The reamer which hereafter will be known as the Peerless has blades of high speed steel brazed into a body of tough steel, with the result that the parts are

united into one solid piece. The body of the reamer is of low carbon steel, especially selected for elasticity and shock resisting qualities. Two distinct types of reamers will be made, both intended for hand and machine work; the one is ordinarily termed solid, the other expansion. The process for brazing the blades is the same in each. The expansion type is expanded by means of a plug threaded at the point, with a taper seat near the top. The increase of diameter takes place at the extreme point, or, in other words, the part where the cutting is done. The advantage of this feature will be readily appreciated by all mechanics.

The Cleveland Wrought Washer Company has commenced the erection of a plant on West Fifty-eighth street. The building will be 40 x 185 ft. The company has ordered equipment for its power plant and some of its machine tools, but expects to be in the market for additional punching presses, shapers, shears and planers. The company has affected its organization by the election of Charles Wasmer, president; J. G. Bettcher, vice-president, and Carl E. Kramer, secretary and treasurer.

The Kilmer Wire Company, Cleveland, has been incorporated, with a capital stock of $225,000, by M. D. Kilmer, B. A. Clark, Frank E. Hamen, William B. Eva and C. M. Lemmon. The company will probably succeed the Ohio Bale Tie Company, of which M. D. Kilmer is manager, and will manufacture wire fence, bale ties and wire specialties.

The work of reconstruction of the National Stove Company plant of the American Stove Company, at Lorain, Ohio, has been started, and the plant will be completed in 90 days. The main building will be 60 x 450 ft., two stories high, and this will be divided by three fire walls. Separated from the main building will be a power house 40 x 63 ft. The buildings will be of brick, with steel and wooden framework.

The Lamson & Sessions Company, manufacturer of carriage nuts and bolts, has commenced the erection of a three-story 30 x 50 ft. addition to its plant, more room being required because of the growth of the business. The company will purchase no additional equipment.

The Independent Steel & Wire Company, Cuyahoga Falls, Ohio, has acquired a site adjoining its plant, and it is reported that the company will soon erect a large addition to accommodate its increasing business.

The Warsaw Wire Fence Company, Warsaw, Ohio, has been incorporated, with a capital stock of $25,000, to manufacture woven wire fencing, fence posts, stretchers, gates, &c. The company will take over the Whitely plant of the Farmers Co-operative Harvester Company, at Warsaw, which was built to make wire fence, but never operated. The incorporators are James L. Beck, P. M. Moore, John W. Stanton and J. F. Wagner.

William Clerkin has disposed of his entire interest in the Twentieth Century Heating & Ventilating Company, Akron, Ohio, to John Kerch and George Maag, and has resigned his position as president and manager of the company. Mr. Clerkin is preparing to organize a $250,000 company for the manufacture of stoves and furnaces and steam and hot water boilers, and intends to erect a large plant in Akron. The new company will either be a combination of Mr. Clerkin's interests and those of another concern now in business in Akron, or it will be an entirely new company. Mr. Clerkin organized the business now represented by the Twentieth Century Company 13 years ago and has been at its head ever since.

The plant of the Cheswick Mfg. Company, Canton, Ohio, has been purchased by F. G. Borden and associates of Pittsburgh. tI is stated that the new owners will organize a company for the manufacture of enameled bathtubs, washstands and sinks. The Cheswick plant was originally built for the manufacture of pressed steel cars. Work of remodeling the plant will probably start soon.

The American Case & Register Company is negotiating for the removal of its plant from Alliance to Salem, Ohio. A site has been secured, and the Salem Board of Trade has assured the company a big bonus. If the removal takes place a large plant will be built.

Philadelphia Machinery Market.

PHILADELPHIA, PA., September 3, 1907.

The situation in the local machinery market appears to be dominated almost entirely by financial conditions. Manufacturers and merchants attribute the weakness in buying almost entirely to this cause, and it is the general opinion that until this condition becomes more satisfactory there will be little prospect for any marked improvement. The month just closed will probably figure out a fair one, and while it is too early to obtain actual figures it is thought that sales will average up as good as those during July, and may in some cases even exceed the totals for that month. August is generally a rather dull month in the machinery trade, the vacation period having as a rule more to do with the temporary withholding of business during that month than at any other time during the year.

Sales of machinery and tools in the week just closed were rather irregular, some lines of tools being in fair demand, while for others there was practically no call whatever. Sales of milling machines, lathes and planers were to be noted, but mostly in single lots, and usually in the medium and smaller sizes.

Some little business has been placed by the railroads in this territory, but it has been confined mostly to single tools for replacement and does not on the whole aggregate any very large amount.

The outlook for future business is somewhat more encouraging, several fair sized lots of tools, which will in all probability develop into orders in the next 30 or 60 days, being before the trade. One good sized equipment, which it was thought would come out at an early date, may be postponed until next spring, or, at any rate, will not be closed much before the end of the year. General inquiries, however, are a little better, but are generally confined to single tools and minor lots. The trade looks forward to a better demand during this month, although it is scarcely believed that any very large buying movement will set in before October 1.

Manufacturers and tool builders keep actively engaged. Order books are still pretty well filled, and while business is not coming in at anything like the rate that deliveries are being made, there is still enough business on the books to keep plants fully occupied for some months to come.

There has been no change in the foreign demand. Inquiries have been light, and little business in the standard types of machine tools has been done. The demand for special tools has been a little more active, and builders of such tools report booking several fair orders. Exportations of power transmission equipment keep fully up to the average for the season of the year.

There was a slight improvement in the demand for second-hand machine tools during the past week. Sales, however, were confined largely to the smaller tools and machines. Here and there a sale of one of the tools of the heavier type was to be noted, but the aggregate sales of all classes of second-hand tools was by no means large. The demand for second-hand boilers and engines has been more or less irregular for some time. Last week's business was spotty, and was confined largely to those of the smaller horse-powers.

While both iron and steel casting plants continue actively engaged, there is a more determined effort being made on the part of the foundrymen to secure business. Some classes of castings are as hard to get as ever, particularly for early delivery, but others can be had for fairly prompt delivery. The general weakening in the demand for machine tools has been felt by foundries making that class of work, and as a rule machinery castings are in somewhat better supply.

J. A. Hollinger, Chambersburg, Pa., has had plans prepared for a large planing mill, to be erected at that place. The buildings are to be three stories high in part, and will include a main mill building, a power house, sheds, dry kilns, &c. Electric lighting and other modern equipment are to be installed.

The Tropenas Steel Company, which will in the near future erect a steel casting plant at New Castle, Del., is preparing plans for its buildings, and taking bids for machinery and equipment of every character incident to the production of steel castings by the Tropenas method. Eighty-eight acres of ground have been acquired by the company at the above place, having a frontage of 1200 ft. on the Delaware River and 1800 ft. along the Delaware Division of the Pennsylvania Railroad. A number of large buildings are to be erected, including a foundry building, cleaning building, blacksmith shop, large machine shop, and a power house. Electrical power will be used extensively. It is hardly expected that actual work of building and equipping the plant will be started before next spring. Meanwhile a temporary office will be maintained by Arthur Simonson, general manager, at 554 North Fifty-eighth street, Philadelphia. The officers of the company, which is incorporated with a capital of $750,000, are: President, A. Tropenas; vice-president, treasurer and general manager, Arthur Simonson; secretary, D. J. Reinhardt.

The Ajax Grieb Rubber Company, Trenton, N. J., has had plans prepared for a rubber manufacturing plant. The plans include a power house, factory, warehouse, storage and office building. W. W. Slack, 18 East State street, Trenton, N. J., is the architect and engineer.

The American Pulley Company reports trade fairly active, although not in as great a volume as it was early in the year. The foreign demand for pulleys keeps up very well, and in addition to one shipment aggregating six carloads for export to Germany, shipments have also been made recently to Great Britain, New Zealand and Australia. The domestic demand includes orders from all sections of the country, covering the usual range of sizes. Shipments in carload lots are being made to San Francisco, Cal., the

Middle West, and Southern territory, while business in local and nearby territory continues good.

The E. H. Mumford Company, builder of foundry molding machines, in announcing that the company had taken the sales agency for America of the Ph. Bonvillain & E. Ronceray universal system of machine molding and the accompanying system of pattern making, states that the system is one which can be readily adopted by every foundryman. At present the machines are being imported from France, but plans are being considered which it is hoped will shortly be concluded, for the manufacture of these machines in America. The Mumford Company reports quite an extensive sale of the French machines, considering their recent introduction, and reports that indications favor a large sale of machines of that type. The company has also made several good sales of Rathbone multiple molding machines, three having been shipped recently. Pridmore molding machines have also had a good sale, while 12 Mumford machines of the split pattern power ramming type were recently sold, for shipment to Montreal, Canada. Nine split pattern power ramming machines were recently shipped by this company to parties in the New England States. Six machines have also been shipped to Canada, while local and nearby deliveries have also been quite extensive.

The Vandyck-Churchill Company, machine tools and equipment, has removed its local office from the Bourse Machinery Hall to 917 Arch street, where the first floor and basement of a modern building have been secured. This will give the company a floor space of 29 x 106 ft. on the ground floor. Two-thirds of the floor space, comprising the rear portion of the store, is lighted by means of two large skylights, so that the whole floor space is no doubt the best lighted in the city for the purpose of showing a machinery display. In the rear of the store a yard and shop, 29 x 35 ft., can be made available for storage and other purposes. The Vandyck-Churchill Company will continue to maintain its warehouse on St. James street, as heretofore.

New England Machinery Market.

WORCESTER, MASS., September 3, 1907.

The week has shown no marked change in the machine tool market. Business is comparatively quiet, but with a steady demand for single machines and small lots, with the conspicuous exception of an order for presses booked by a Boston dealer, totaling about $20,000. The trade is quite cheerful during such a period as Labor Day week, which is normally the worst of the year from a business standpoint. The machine tool people are settling down to the idea that business has struck a lower notch, and are in a condition to appreciate keenly the betterment which should come, according to general expectation, in the next month or two. There is little buying for delivery further than 90 days, excepting those machines which have made small gains in deliveries, such as milling machines, grinders, some radials and automatic and turret machinery.

No cancellations are reported. This is considered especially significant, for if ever a premium could be placed on the rescinding of orders the condition exists to-day. Many deliveries are being made of machines, shipments of which were promised months ago. It is a common occurrence to receive a machine which, according to the terms of the contract, was due to arrive last January, or earlier. If any lack of confidence existed among customers these machines would not be accepted. But such occurrences are not reported.

The custom of a 12½ per cent. discount to dealers has become quite general among the machine tool manufacturers during the past year. The change had a rather gradual beginning, but of late the practice has grown rapidly, until companies adhering to the 10 per cent. rule are in the minority. Of these latter a large proportion are expected to adopt the new discount later on. A few manufacturers remain who believe they can assist their dealers to better advantage in some other manner, such as advertising. The extra 2½ per cent. is a very important factor, constituting, as it does in many cases, an extra margin of profit.

The engine builders complain that there are few large units of power in sight, inquiries of this character not being numerous at present. On the other hand, little complaint is heard from the boiler trade, and in some shops almost a record business is in the works.

Interest is attached to the auction sale of the business, plant and real estate of the Providence Steel Casting Company, Providence, R. I., which will be held October 2. The works of the company are shut down because of bankruptcy proceedings. The demand for steel castings in Providence and the immediate vicinity is great, and there is regret that the foundry has been compelled to cease production, and hope that the business will be continued by new owners. The foundry is equipped to make steel castings by the Tropenas process.

The Atlas Machine Tool Company, Taunton, Mass., builder of plain and universal grinding machines, is to take the entire building at 4, 6 and 8 Porter street, of which it now occupies a part. The present 5000 ft. of floor space will be increased to more than 20,000. The company states that it will be in the market a little later for a miscellaneous lot of machine tools with which to equip the new manufacturing space. Although the company has but comparatively recently placed its grinding machines on the market, the demand has become so considerable that foreign business alone would keep the present shop running full, and consequently additional manufacturing space has become a necessity. W. L. Gifford is president, and C. G. Trefethen is the treasurer and general manager of the business, and the designer of the company's machines. He was formerly with the Brown & Sharpe Mfg. Company, Providence, R. I., in the grinding machine department of the works.

Local report that the Boston & Maine railroad contemplates increasing its shop facilities at Springfield is officially denied by the company. The rumor comprised a plan to remove the Springfield shops to the neighboring city of Northhampton, Mass., because of a campaign being conducted at Springfield with a view to abating a smoke nuisance. It is understood that the railroad company is in need of better shop facilities at the western end of its system.

The business of the Gardner Foundry Company and the General Foundry Company, Gardner, Mass., manufacturers of gray iron castings, have been consolidated, and a new company organized, under Massachusetts laws, to be known as the Gardner-General Foundry Company, with a capital stock of $50,000. Edward G. Watkins is the president, Ralph N. Wiley, clerk and treasurer, and Gustaf Erick Hoglund, general manager, the board of directors comprising these officers and Gustaf Emanuel Hoglund and Thatcher B. Dunn. The business was established in June, 1901, at the present site of the main foundry and office, as a co-partnership between President Watkins and Gustaf Erick Hoglund, employing three molders and a helper. Three years later an addition was erected to take care of the growth of business, the capacity being doubled, and in December of last year the Gardner Foundry was purchased, new equipment installed, and additional molders employed. Both plants are to-day rushed to full capacity and should business continue to increase more room will soon be a necessity, the company states.

It is probable that the Dighton Furnace Company, Taunton, Mass., manufacturer of furnaces and ranges, will wind up its existence as a result of the recent fire which destroyed its plant, but it is also probable that a new company will be organized to continue the business in some manner. The company has had a large general foundry business, as well as its regular lines, and it is presumed that at least that part of the business will be continued, and in Taunton the new owners are looked to to continue the manufacture of stoves and ranges.

Herbert C. Wood, 18 Purchase street, Taunton, Mass., is establishing a shop which will be equipped with machine tools for the manufacture of a product concerning which he is not yet ready to make announcement.

Government Purchases.

WASHINGTON, D. C., September 3, 1907.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until September 17 for six electric drills, eight electric grinders, one air compressor, one core making machine, eight hydraulic jacks, five lathes, one speed lathe, one metal band saw machine, one engine and a large quantity of other supplies.

The Isthmian Canal Commission will receive bids until September 25. Circular No. 388, for steam shovels, steam churn drills, air compressor plant, including air compressors, air receivers, boilers, pumps, condenser, feed water heater, oil separator, &c.; tandem compound engine, 100-kw. generator, induction motors, rock drills, &c.

The Isthmian Canal Commission will receive bids until September 28, Circular No. 389, for steel barges.

The Isthmian Canal Commission will soon ask bids for one steam steel tug boat about 100 ft. in length over all, to be equipped with Scotch boilers, electric lights, steam steering and capstan engines; one beading machine, adjustable gutter beader, stove pipe slip roll former, 20-in. groover, two 36-in. double seamers, circle shears, 36-in. squaring shears, lever punches, two large turning machines, two large burring machines, two back geared heavy setting down machines, three bench shears, 36-in. heavy open throat sheet iron folder, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until September 10 for steam windlass, motor, generating sets, motor generator, screw cutting lathes, shaper, drill press, radial and sensitive drills, bolt cutter, drill grinder, pressure blower, plate bending rolls, pattern makers' lathe and planer.

The Quartermaster, Fort Barrancas, Fla., will receive bids until September 26 for constructing a 200,000 gal. reinforced

concrete reservoir, installing one steam pump and one steam air compressor, and extending water main.

The following bids were opened August 27, for supplies for the Navy Yards:

Bidder 12, American Blower Company, Detroit, Mich.; 13, Atlantic Works, Philadelphia, Pa.; 22, Buffalo Forge Company, Buffalo, N. Y.; 27, F. S. Banks & Co., New York; 35, Chicago Pneumatic Tool Company, New York; 37, Corsicana Equipment Company, New Orleans, La.; 42, Central Metal & Supply Company, Baltimore, Md.; 46, Curtis & Curtis Company, New York; 51, Columbus Pneumatic Tool Company, Columbus, O.; 58, Dravo Doyle & Co., Philadelphia, Pa.; 74, Frevert Machinery Company, New York; 77, J. A. Fay & Egan Company, New York; 79, Geo. N. Gardner & Son, New York; 84, General Electric Company, Schenectady, N. Y.; 85, Greenlee Bros. & Co., Chicago, Ill.; 89, Hisey-Wolf Machine Company, Cincinnati, O.; 107, Independent Pneumatic Tool Company, Chicago, Ill.; 108, Ingersoll-Rand Company, New York; 114, Knox & Bro., New York; 117, Kenworthy Engineering Company, Waterbury, Conn.; 123, A. M. Lockett & Co., New Orleans, La.; 142, Montgomery & Co., New York; 150, National Electric Supply Company, Washington, D. C.; 158, Oliver Machinery Company, New York; 165, Philadelphia General Supply Company, Washington, D. C.; 184, Sherman-Brown-Clements Company, New York; 191, Standard Railway Equipment Company, St. Louis, Mo.; 211, Toledo Machine & Tool Company, Toledo, Ohio; 219, Vermilye & Power, New York; 220, Woodward, Wight & Co., New Orleans, La.; 224, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 233, Crescent Machine Company, Letonia, Ohio; 234, Drew Machinery Agency, Manchester, N. Y.; 237, Excelsior Equipment Company, Pittsburgh, Pa.; 242, O. K. Olson, New Orleans, La.

Class 21. One rotary shear, motor driven—Bidder 74, $679; 211, $1335.

Class 22. One band-saw machine, motor driven—Bidder 13, $1940; 77, $1455.

Class 24. One hand planer and jointer—Bidder 13, $560; 79, $623; 85, $592; 158, $733 and $526.

Class 25. One universal saw bench—Bidder 74, $519; 77, $610; 158, $645; 233, $525.

Class 31. One pipe cutting and threading machine—Bidder 27, $1024.50; 42, $1007; 46, $1007; 74, $1094; 150, $1143; 219, $995; 234, $1089; 237, $1800.

Class 32. One 75-kw. turbo generator, one balancer set, one switchboard to control same, and one feeder panel—Bidder 58, $4400; 84, $5350.

Class 72. One pipe bending machine, slitting shears, beater, burring machine, &c.—Bidder 114, $546.70; 142, $560.85; 220, $1510.38.

Class 73. One steel pressure blower and 1 exhaust fan—Bidder 12, $139.85; 22, $137.45; 234, $306; 242, $310.

Class 75. One oil pumping apparatus—Bidder 37, $159.81; 117, $477.50; 123, $175; 242, $395.

Class 131. One type N and one type N-N portable electric radial drilling machine—Bidder 35, $335; 89, $450; 184, $447.

Class 141. Four variable speed electric motors—Bidder 84, $1540; 224, $1384.

Class 145. Two pneumatic hammers and three dozen chisels—Bidder 35, $94; 51, $75.50; 107, $98.40; 108, $107; 165, $147; 191, informal.

Bids were opened as follows at the office of the Isthmian Canal Commission, August 26, Circular No. 383, for six steel barges:

Item 1, delivery No. 1, six steel barges, erected, completed and delivered at La Boca, Isthmus of Panama; item 2, delivery No. 2, six steel barges, knocked down and securely packed for ocean shipment and delivered on dock at Colon or La Boca, Isthmus of Panama.

Maryland Steel Company, Sparrow's Point, Md., item 2, make shipment of three barges in 120 days and complete shipment of six barges in 200 days; total for all, $125,700; delivery at Colon.

Moran Company, Seattle, Wash., item 2, delivered on dock at La Boca; will ship from Seattle, Wash., in 180 days and complete shipment from Seattle in 180 days, $110,000; unable to guarantee time of transportation from Seattle to La Boca; additional proposition, barges knocked down, f.a.s. at Seattle, $98,000; time of delivery same as former proposition .

Motley, Green & Co., New York, item 2, delivery at Colon; commence within 170 days and complete within 170 days, $88,000.

Newport News Shipbuilding & Dry Dock Company, New York, item 2, delivery at Colon; will commence within 243 days and complete within 273 days, $120,000.

U. S. Steel Products Export Company, New York, item 2, delivery at Colon; will commence within 230 days, and complete within 230 days, $135,300.

The following bids were opened August 22, Circular No. 382, for supplies for the Isthmian Canal Commission:

Bidder 17, Fairbanks Company, New York; 21, Fox Bros. & Co., New York; 24, A. D. Granger Company, New York; 30, International Electric & Engineering Company, New York; 42, Manning, Maxwell & Moore, New York; 48, Motley, Green & Co., New York; 54, Niles-Bement-Pond Company, New York; 59, Prentiss Tool & Supply Company, New York; 71, B. F. Sturtevant Company, Hyde Park, Mass.; 74, Vandycke-Churchill Company, New York; 79, Western Electric Company, New York; 80, Westinghouse Electrical & Mfg. Company, East Pittsburgh, Pa.; 84, Excelsior Equipment Company, Pittsburgh, Pa.; 86, Frevert Machinery Company, New York.

Class 18. One engine and dynamo—Bidder 24, $595, 120 days; 30, $620, 45 days; 71, $665.50, 60 days; 79, $512, 150 days; 80, $508, 120 days; 84, $599, 75 days.

Class 20. One belt driven boring and turning mill—Bidder 21, $4700 and $4300, 95 days; 42, $4768, 270 days; 54, $5790, 155 days, and $4700, 120 days; 59, $4480, 70 days, $4340, 90 days, and $3990, 90 days.

Class 21. Three wheel and lever plain drilling machines—Bidder 17, $265.50, 30 days, and $228, 21 days; 21, $200.94, 40 days; 42, $279.72, 150 days; 54, $255, 90 days; 59, $324, 20 days; 74, $255, 30 days; 84, $254.70, 30 days; 86, $246, 50 days.

Class 22. One screw cutting engine lathe—Bidder 17, $1105, 120 days, and $1135, 150 days; 21, $1030, no time, and $970, 80 days; 42, $1168.55, 120 days; 54, $1140, 90 days; 59, $1381, 60 days; 74, $1095, 75 days; 84, $986, 15 days; 86, $948, 180 days.

Class 23. One double punching and shearing machine, one set splitting shear tools—Bidder 21, $930, 70 days, $1049, 60 days, and $1098, no time; 42, $1303.98, 120 days; 54, $850 and $1125, 90 days; 59, $855 and $998, 90 days; 74, $1075, 120 days; 84, $1035, 40 days; 86, $1025, 70 days.

Class 24. One power plate splitting shear—Bidder 30, $625, 75 days, and $975, 120 days; 48, $625, 50 days, and $975, 160 days; 54, $1035 and $1258, 90 days; 74, $635, 120 days; 86, $861 and $1085, 120 days.

The Ransome Concrete Machinery Company, Dunnellen, N. J., has been awarded contract for two 20-ton traveling cranes for the Puget Sound Navy Yard, at $8978, bids for which were opened July 20.

The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., has been awarded contract for revenue cutter No. 18, for $166,000.

The following awards have been made for supplies for the navy yards, bids for which were opened July 9:

B. F. Sturtevant Company, Hyde Park, Mass., class 111, one exhaust fan, motor and dust collector system, $940.

Toledo Machine & Tool Company, Toledo, Ohio, class 112, one small trimming press, $750.

Under bids opened June 25 for supplies for the navy yards, the following awards have been made:

Niles-Bement-Pond Company, New York, class 125, one horizontal boring machine, $1950.

S. M. Price Machinery Company, Norfolk, Va., class 126, one cold metal sawing machine, $1025; class 128, one automatic circular saw sharpener, $165.

The Carnegie Steel Company, Pittsburgh, has just completed and put in operation a three-high 30-in. billet mill at its Donora Works, Donora, Pa. Heretofore this plant has been equipped with a 40-in. mill which was too large for rolling 4 x 4-in. and smaller billets. This new billet mill is an auxiliary to the 40-in. mill and 4 x 4-in. billets will be rolled on it from the initial heat, and will allow the Carnegie Steel Company to furnish the American Steel & Wire Company at Donora its full supply of 4 x 4-in. Bessemer billets, which heretofore have been shipped from the Clairton and Homestead Works. The billet mill and the front and back lift tables were built by the Pennsylvania Engineering Works, New Castle, Pa., while the rest of the tables were built by the American Bridge Company at Pencoyd, Pa., this concern also erecting the steel building containing the mill. The 40-in. mill has a capacity for rolling 45,000 tons of ingots per month, while the new billet mill will roll from 1000 to 1200 tons of 4 x 4-in. billets every 24 hours. The engines for the mill were furnished by the Wisconsin Engine Company, Corliss, Wis.

The Carbon Steel Company, Pittsburgh, has acquired the properties, patents, &c., of the Damascus Nickel Steel Company, Carnegie, Pa., and the plant of the Black Cutlery Company, Scottdale, Pa. It is the intention of the Carbon Steel Company to operate both plants, supplying the steel for the plant of the Damascus Nickel Steel Company where it will be rolled into smaller forms and then shipped to the Black Cutlery Company, to be made up into cutlery. It is probable that large extensions and improvements will be made to both plants by the Carbon Steel Company.

HARDWARE

WITH the progress which is constantly being made in manufacture and the bewildering development of novelties as a result of invention and enterprise, there is in Hardware, as in many another field, a persistent adherence to type and a refusal to abandon the old ways. The history of the trade, indeed, abounds in illustrations of the failure of articles and devices, theoretically plausible and attractive, to find a place for themselves in the market. It is interesting to observe the persistency with which certain patent contrivances keep reappearing, and, like Banquo's ghost, will not down. The value of these patents is founded purely upon theory, although the theory itself is unassailable. Take, for instance, the matter of the Gravity Lock. There have been innumerable inventions along this line, but few of them have got beyond the patent office papers, and the few that have been manufactured meet with but scanty sale and are soon forgotten. Yet the inventor of a new Gravity Lock is always in evidence. He relies upon the fact that the springs of Locks break, and that a Gravity Lock is, therefore, the correct principle. For reasons not easy to state definitely, the Spring Lock continues to flourish and the Gravity Lock still exists only in theory. Another item awaiting recognition is the Ratchet Wrench. The Screw Wrench, of course, has its limitations, and, as in the case of the Spring Lock, the invention of the new device is founded on the confessed imperfection of the article that is most in use. The Ratchet Wrench at any rate has met with no general favor. While some find a market and are valued by those who use them, comparatively few of those invented get far enough along for the public to try them and find out what is the matter or how good they really are. These novelties, with the Keyless Lock and many another ingenious and meritorious article, remain without the reward of popular approval and wide sale to which, theoretically, they would seem to be entitled.

Those who devise specialties which are designed for every day use have much difficulty in striking the popular fancy. The idea which is put into concrete form may be meritorious. A test of its use may at once impress a few that it serves its purpose admirably. Their praises encourage the inventor and he believes that he has been successful in bringing forth something which will be both creditable to himself and valued by those who buy it. It, perhaps, is manufactured in quantity and means are taken to introduce it on the market. If it happens to be radically different from what the world is accustomed to using for the purpose, its novelty may be the inducement for some to try it, but, on the other hand, that very feature may prevent its widespread acceptance. The favor of the multitude is something which cannot be foreseen, nor can its whimsicality be explained. The judgment of the few, although persons of experience, may be wholly wrong as far as the popular appreciation of the article is concerned. Numerous instances can be cited of novelties which appeared to have great merit, but when they came to be inquired for, a few years after they were first sold, none were to be had, and the answer to an inquiry for them was that "they did not take and their manufacture was discontinued." The cause of this may not be a question of price, for the novel article was sold at about the same price as the one which it sought to displace. The trouble was simply that it did not catch the fancy of the people at large. Manufacturers of small wares who have had much experience become exceedingly cautious in trying new things even if they seem to have strong points to commend them and even if those to whom samples are submitted express strong admiration and assert their belief that they will find a ready sale. Over and over again does the housewife who bought a novel utensil and who used it until it wore out find, in endeavoring to replace it, that no merchant keeps it, as the demand for it was not sufficient to warrant the manufacturer in continuing its production. The fact of its discontinuance does not prove that it was not worth making. The reason is a totally different one. It is simply that not enough people could be found to realize its merit.

Condition of Trade.

The past week has been exceptionally quiet in the Hardware trade. In the prevailing dullness many yielded to the temptation to extend the holiday period a day or two, feeling that nothing was likely to transpire which would require immediate attention. The feature of greatest importance was the advance in Wire products, referred to elsewhere, which came as a surprise to many, although the possibility of such a movement had been distinctly suggested by the controlling interests. Comment on the advance is of a varied nature, but it is widely remarked that the announcement was well timed and may have a more or less steadying effect on a market, the undertone of which is none too strong. Encouragement must be felt at the continued activity of the jobbing trade whose optimism is again reflected in the semi-monthly letters of our correspondents. Something is now heard, however, of requests to hold up or postpone shipments, which tends to create the impression that merchants are governed by a conservative view of the future course of business. The stringency in financial quarters is also having an unmistakable effect in limiting activity and restricting purchases. Certain it is that banks are unwilling or unable to extend the full accommodation usually enjoyed by their clients. The argument that a contraction in business will lead to an easing of monetary conditions is not received with entire complacence. It is becoming a commonplace to say that trade in general holds better with a more confident feeling, and that financial problems are less acute in the Central and Western States than in the East.

Chicago.

Satisfaction with the results of August business is generally expressed by the Jobbing Hardware trade, which with few exceptions estimate its volume to have been almost, if not quite, up to that of the same month of the preceding year. The totals realized in a measure overreach expectations; for the feeling prevailed that to usual seasonable dullness there would be added the retarding effects of conservative action in buying. It is not questioned, however, that in certain parts of the country where pronounced crop shortages were suffered the local trade of both jobbers and retailers has experienced marked curtailment. But these deficiencies are too small to make an appreciable showing upon the general volume of business. Many of the shipments included in the account of sales for the month just closed were doubtless in execution of contracts made earlier in the year, but the fact that they found prompt acceptance

indicates a healthy consumptive capacity. In fact replies to inquiries sent broadcast through the country by banking and other interests indicate that aside from slow collections—the results in a large measure of crop moving conditions—no complaints are heard from merchants either as to the present state of trade or its future outlook. One of the few lines that fell short of expectations in the season's trade is Woven Wire Cloth. While first sales were entirely satisfactory in amount there were practically no reorders. Consumptive demand was light and as a result there is more or less stock in cloth, screens and screen doors in dealers' hands to be carried over. In explanation of this it is said that following dry seasons such as was experienced last year a light demand usually results, because of the absence of moisture's damaging effect upon wire cloth. It may be too that if the plans of the manufacturers for disposing of their product are carried out there will be substantial regularity in next year's market. The restoration of practically normal promptness in the execution of orders in most factory products has eliminated a source of annoyance and trouble to all parties concerned from manufacturer to consumer. Shipments in almost every line are now coming forward without unusual delay, though in Galvanized Sheets the mills have not fully disposed of forward accumulations. In the general adjustment of prices the prevailing tendency is no longer toward advance and values seem now to be quite stable. It is true that in some directions evidences of concessions from current quotations appear, but this is the exception rather than the rule.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—The continued hot weather is of great benefit to the corn and cotton crops. Conditions have improved several points in the past 30 days.

Business continues to show an increase over last year, but it must not be forgotten that goods are higher this year than last and that the same volume of goods would make a greater showing in dollars and cents.

In discussing the tightness of money, a merchant recently remarked that as goods were so much higher than they had been it took more capital for jobbers and retailers to handle the same amount of business, and that this demand for increased capital was in direct ratio to the increase in the value of goods. This may be one of the factors in the tightness of money.

The writer has just returned from a short trip East. I am glad to state that here in the West trade, generally speaking, does not share in the pessimistic feeling of Eastern merchants. Possibly we Westerners do not own as much unearned increment in the form of railroad stocks and bonds as our friends in the East. Therefore we have not been quite as much interested in the slump in values of these stocks.

We think it is a good plan to run a business according to the facts in connection with that business and not according to what we read in the newspapers. We are recommending the same course to our customers. It is somewhat ridiculous for a small dealer who may be doing business in a section where crops are abundant and money plentiful, or where conditions are at least normal, to shut off his buying and be out of goods on account of what he reads about bear raids in Wall Street.

It has been our observation in times of depression in the past that those manufacturers, jobbers and retailers do the best who keep up their stocks and take good care of their orders. We have had dealers tell us they made more money in bad times than in good times, because their competitors became frightened, lost their nerve and allowed their stocks to run down.

We do not recommend over-buying, but we do strongly recommend keeping stocks complete by buying frequently. With the great stocks in the hands of jobbers there should be little excuse for a retail dealer who buys carefully to be either overstocked or to be short of goods.

We believe most of the overstocking on the part of the retail trade is in the larger towns and cities, where some of our good friends among the manufacturers give retail dealers an opportunity to get in on the ground floor. Of course when a retail dealer is placed on the jobbing list he feels it is up to him to show his appreciation by quite a large order. It is a matter of pride with him to show what a large order he can place, and frequently he will order enough goods to last him a year or two, forgetting the extra 5 or 10 per cent. will be eaten up in interest on the investment, warehousing, taxes, insurance and depreciation in stock.

Recently the writer was discussing this matter with a retail dealer who carries a stock of $20,000 in one of our neighboring cities. I offered to make a wager with him:

First. That out of his $20,000 stock he had on hand $5000 of overstock—not necessarily dead stock, but that he had, for instance, 1 gross of a certain item when a sufficient stock would be three dozen.

Second. That if he bought all his goods from jobbers, buying frequently in moderate quantities, he could do just as much business as he was doing on an investment of $10,000 and that he could put the other $10,000 out at a good round rate of interest.

This dealer, of course, did not agree with me, but he admitted that in trying to get an extra 5 per cent. he had in several cases overstocked himself.

Some of my readers may say "this is good jobbers' talk," but I suggest to some of our friends among the retail dealers if the smile on the face of their banker is not quite as broad as usual, if collectons seem to them a little slow and their creditors seem somewhat insistent, they figure out carefully whether the jobber, of whom they can buy a moderate quantity and from whom they can receive an immediate shipment, is not after all quite a convenience, and also if he is not entitled to a reasonable compensation for his services.

We look forward to a satisfactory fall business—the business is coming now. Collections are a little slow, but this is always the season of the year when it is "between hay and grass" with the retail trade.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Trade conditions in the Northwest are favorable. The weather is excellent for harvesting in North and for stacking and threshing in South Dakota and southern and central Minnesota and Wisconsin and northern Iowa. Crops are generally fair, with good prospects for fall trade. Collections are good.

Boston.

BIGELOW & DOWSE COMPANY.—August has been a pleasant month, and the seashore resorts have been overcrowded with guests, who have enjoyed most delightful weather, which has brought with it renewed strength and vigor to take back to their many Western and Southern homes. Notwithstanding the days are getting cooler, the air is invigorating, and many visitors will enjoy another week at the shore, when they will go for a finish to the mountains. A little later the landlords will count up their sheckles and hie away to open their winter resorts in the South. The continuous good weather has been good for the guests and profitable for the hotel men. Country fairs and horse races are now in order for September.

Notwithstanding all the fun one can find in a New England summer, the great manufacturing interests are running all the time and general business keeps on its course just the same. Vacations are nearly over and it will be a happy relief when all are back again. General business in August will show a handsome increase over last year.

Collections have not fallen below the average notwithstanding a close money market. Prices are holding firm and are being well maintained. Comparing the present with the past it is still difficult to get prompt shipments from the factories.

There is conservative buying and an inclination to reduce stocks, but with it all a realizing sense that to hold one's trade the assortment must be kept intact.

This feeling helps the jobber who has the stock and can deliver the goods. The confidence in the management of the trusts and combinations who control the base ma-

terials that enter into the manufacture of Hardware will prevent any panicky conditions this fall. We all want a steady market and a well assorted stock. With these we will do a good business and be well satisfied with the results at the end of the year.

Cleveland.

THE W. BINGHAM COMPANY.—Confidence seems to have got the upper hand of pessimism, and we see no reason why we should not have continued good trade all through the balance of the year. The prospects are good for an average crop of grain, our mines are yielding a large amount of precious metal, our forests are contributing a large amount to our wealth, the output of our factories in other than food products is immense, the railroad companies are all doing a good business; in fact, industrial and agricultural prospects of all kinds are good.

September 1 seems to be the turning point or barometer for the fourth quarter of the year, and a large amount of goods will go forward on that date on orders taken early. Prices for the most part are steady—no indication of a break or seeming necessity for it.

Orders for Merchant Pipe, Tin Plate and Galvanized and Black Sheets placed last February, March and April with mills are just now being filled, and we are anticipating our wants and putting in orders to come along as fast as the mills can supply them. The demand through the retailers on the jobbers for Black and Galvanized Merchant Pipe in the last year has been very large indeed, and through persistent efforts we have accumulated stocks from time to time and our customers have patiently waited for our shipments and have been fairly well supplied during the season in this way.

The manufacturers of Carriage Bolts, Machine Bolts and Lag Screws are catching up on their back orders somewhat, still there is a shortage and a steady demand. Some kinds of Mechanics' Tools are scarce, as the demand the last year and a half has been immense. Axes, Shovels and Scoops at the prices many jobbers are offering them at present are a good purchase.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Despite the free volume of business manifest in all lines, corroborated by the huge gross earnings of the railroads, there is a certain hesitation about booking orders far ahead, for heavy material, especially, or in indulging in large purchases, except where the stuff is already placed by contract or pressing need. This hesitation has by no means abated the flush tide flowing in from country dealers, and those jobbers who are provided with ample stocks are proceeding with full sail set, with no untimely feeling of apprehension on any score.

This confidence in prices is more pronounced in the highly manufactured stocks, where skilled labor constitutes the main cost. In raw material this does not influence proportionately, for that is more sensitive to the speculative markets. In branches of manufacture the skilled mechanic has received the benefit of higher pay and shorter hours, which process cannot be reversed all of a sudden. We are on a higher scale of living and the expenditures are proportionate to the increased wages. It is not so easy to get down to "hog and hominy" after eating chicken and waffles (see *menu* of Secretary Taft at Lexington for particulars), as it used to be in the old times.

We are watching in this part of the country with a great deal of interest the outcome of Secretary Cortelyou's devices to relieve the money market by moderate disbursements of Government funds to the banks at crop moving time. The bankers have been apparently undergoing the usual annual complaint of "cold feet," though it came a little earlier this year than heretofore. As an aristocratic symptom, it may supersede hay fever. There are plenty of schemes for spending money. Nearly every private manufacturer would like to enlarge his plant or improve it; every city would like to construct sewers, water works, streets, &c., if only they could get money at 3½ or 4 per cent., as they could a couple of years ago. But that is not to be when the brokers' circulars are quite full of quotations at 5½, 6 and almost 7 per cent. The savings banks—out in the West at least—offer 4 per cent. openly on daily balances, subject to check. Only in those markets where there is an excellent demand at all times they can probably make money at this figure.

Whether this high rate of money is simply a swing of the pendulum and a revolt against the exceedingly low rate of interest which prevailed some years ago, or whether on a permanently higher basis of price, owing to the addition to the world's supply of gold, remains to be seen. In the meanwhile the surface of the earth goes on producing and crop prospects hereabouts are greatly improving, owing to the warm weather after abundant rains. If we do not have too early a fall we shall at least have products of the soil in abundance, which stand for wealth and are as good as gold in the world's markets.

If money becomes too scarce we can go back to Daniel Boone days and pay our debts in coon skins. We are not quite sure whether this currency would go with some of the so-called leading fabricating interests or not whose fashionable headquarters are in Chicago or New York. There are a lot of concerns which manufacture most desirable goods in Kentucky, Indiana, Tennessee and southern Illinois which would lend their assistance in case of emergency and agree to take pay in some sort of "kind."

Pig Iron may have been too high, but Nails, Wire, Bar Iron, Pocket Knives and Tin Pans have been held down within a reasonable figure by the level headed gentlemen who are presiding over our trust bound destinies. As the Hardware trade does not deal in air ships, there need be no fear of any disastrous collapse in stock. Altogether we consider the situation extremely sound and healthy.

New Orleans.

WOODWARD, WIGHT & CO.—The month of August in this section is usually the quietest in the year. This year is no exception, although we have had a very fair volume of business for the season.

The Mississippi River and tributaries have gone down to a stage where levee building and repair work can be done to advantage, and we have noted a good business in Wheel and Drag Scrapers and other levee building contractors' supplies.

There has also been a good trade in Light Hardware for small buildings in many parts of our territory. The influx of immigrants through our new arrangements here may account for some of this latter, as those interested in obtaining desirable immigrants are paying particular attention to housing them properly and making them satisfied with their new surroundings.

While we have been having quite a number of immigrants coming in for the past year, the first arrival of the new Austro-American Line came into port yesterday. This vessel brought 186 Austrians, 163 Greeks and 42 Italians. Of the entire number but 20 were women. Many of them had been farmers of more than medium attainments. Some of them were possessed of as much as $1000, and quite a number of them had more than $500. A large delegation from the Progressive Union, together with the Mayor of the city and the agent for the Austro-American Line, went down to the landing with a brass band and welcomed these people. They all seemed to appreciate their reception, and it will undoubtedly have a good effect on others to follow when they write home to their friends and tell them how they have been treated. This matter was in striking contrast to one of our neighboring States, in whose recent election one of the candidates for a high office made a leading issue of his anti-immigration views, and polled a vote showing a very large following. A large section of the best lands in Louisiana is now being cut over by the lumber interests, leaving as fine farm lands as can be found anywhere and at very reasonable prices.

Quite a few of the recently arrived immigrants went through to various States in the West—some of them as far as California—but a good number have remained for distribution throughout Louisiana at points near by New Orleans.

The labor situation in the rural districts is quite acute, on account of the great amount of work done in the larger cities, making it very hard for the cotton and sugar

planters to obtain the necessary labor for the few months in the year that they need it.

The lumber industry is not improving to any extent. There still seems to be a scarcity of cars, and if orders were plentiful it would be almost impossible to move them. The Isthmian Canal Commission opens proposals in a few days for some 10,000,000 ft. of lumber for prompt delivery, and there will probably be considerable competition on this bid, as a number of the coast mills are not overflowing with business.

Reports from the cotton sections in Louisiana, Mississippi and Georgia show very good weather and the crop making fine headway. The only complaint seems to be from Texas, where there is a scarcity of rain.

The sugar and rice crops are both in fine shape and should produce considerably larger crops than last year. The only danger in sight for the three crops would seem to be an early and severe frost, but with a reasonably late fall the outturn in this immediate vicinity will be very good. These crops, running into considerable money, will relieve the financial situation here very much. Cotton is commencing to come in now, and with the spot market practically bare will sell readily and at good prices.

Taken all in all, the situation in our territory appears to compare favorably with the best that is expected anywhere for the next six months.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Although Wall Street seems to be suffering from a prolonged nightmare, business in our section of the country continues satisfactory, without apparently noticing the financial capers being performed in the little narrow alley in the great Eastern metropolis.

The demand for goods was never better at this season of the year, and we have been much pleased to note that the requirements of the retailers cover a full line of Hardware and that they are buying conservatively. We have examined a great many orders with a view of analyzing the situation, and as a general rule the retailers are making their requisitions for small quantities and sending their orders in quite frequently. This, to our mind, indicates that they are having a healthy demand for the goods they are buying.

The crop conditions in this section are very much better than any one expected two months or six weeks ago. The weather has been quite favorable in most sections of the South for growing crops. The vegetable crop, which was unusually late on account of the lateness of the spring, brought just about as good prices as it usually does, as the crops seem to have been late in other sections as well as this. The tomato and cantaloupe crops of Tennessee have grown to be quite a factor in our prosperity, and have returned to us an immense amount of money this season.

The price of phosphate rock, which is mined so largely in Tennessee, instead of declining as was predicted by a great many people, has steadily advanced until now it is selling at the highest price it has ever brought. Rock analyzing 75 per cent. of bone phosphate is readily sold at $4.50 per ton on cars at the mines. More phosphate mines have been opened in Tennessee in the past six months than were developed in any previous two years.

The demand for coal this summer has been better than it ever was during the summer season, and all of the coal mines in this section are running full capacity and experiencing no difficulty in selling their output.

We don't believe that business conditions were ever more satisfactory than they are to-day. People are buying goods in reasonable quantities, are paying fair profits and meeting their obligations promptly.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—The writer as usual has nothing but favorable conditions to report. This territory was never more prosperous and never in better shape in general business in all lines. One circumstance that might seem to deny this is the fact that one week ago to-day a savings bank in this city closed its doors. This, however, was due simply to ignorance of banking methods, shown in loading up the bank with an excess of one line of bonds, which in the present tightness of the money market could not be realized on. The depositors will undoubtedly get dollar for dollar, and the failure has not affected any of the other banks or any other business in the slightest degree, as the bank was not a commercial but a savings institution. As proof that the failure did not affect other banks of this city, on the second day after the failure the bank clearings of this city showed a 90 per cent. increase over those of corresponding date of last year.

Crops are certain to be heavy in all lines except hops, and prices promise to be good also. What would be the end of the summer slump in ordinary years has already arrived, but this year we can hardly say that there has been a slump in this city. Business has kept up remarkably well in all lines, and promises to be correspondingly good for the remainder of the year.

We are still having trouble getting goods enough to fill our orders, but this condition is gradually being remedied, and as all are in the same fix, both in our line and all other lines of the jobbing business, we really cannot complain.

The railroads have during this summer handled our shipments in much better shape than last, but with the beginning of the wheat movement, which is to be expected any time, the old conditions of car shortage and long delays on the road will probably become unavoidable. This will give the reciprocal demurrage law, which has now gone into effect in this State, an opportunity for a thorough test. As yet, however, enough has not been seen of its action to report either favorably or unfavorably. We will in a few months be able to inform you fully as to the results, both to the railroads, the interstate shipper and the local shipper.

NOTES ON PRICES.

Wire Nails.—Wire Nails and Wire Products were advanced, September 3, 5 cents all around by the American Steel & Wire Company. This was somewhat unexpected by the trade, although reports of a possible advance had been circulated some three or four months ago. Conditions from manufacturers' standpoint are satisfactory. The demand is heavy for season and there is comparatively little complaint of shortage of cars. Steel Nails are moving freely from jobbers' warehouses, and they regard the outlook as satisfactory for the balance of the year. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

New York.—The carload price of Wire Nails was advanced by the American Steel & Wire Company on September 3, 5 cents per keg. Most of the jobbers have Nails on hand purchased at former prices, but will probably advance the price to correspond with the higher cost at mill. The demand continues moderate, with prospect of increasing. Small lots at store are held at $2.30, but this price has been sometimes slightly shaded.

Chicago.—An advance of 5 cents a keg is announced by the American Steel & Wire Company. Though the probability of this action has been widely discussed by the trade, it was by many not anticipated. Specifications and shipments are very heavy, and the new business being booked is surprisingly large for the season. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The extremely satisfactory conditions ruling in the Wire Nail trade for some time still continue, and from present indications will last throughout the balance of this year. Manufacturers refer to present demand as being heavier than usual at this season of the year, while specifications against contracts are coming in very freely and a full supply of Steel and also of cars is being furnished. Shipments by the mills are heavy. New prices, at the advance of 5 cents per keg on September 3, are as follows, f.o.b Pittsburgh, plus actual

freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots, to retail merchants	2.10

Cut Nails.—At the July meeting of the Cut Nail Association a resolution was passed to the effect that if Wire Nails advanced in price before the next meeting of the association (September 25) the price of Cut Nails should be increased the same number of cents per keg as Wire Nails. This automatic advance would bring carload lots to jobbers to $2.15, f.o.b. Pittsburgh. Mills are catching up on back orders and making better deliveries. Specifications on contract orders are heavier than new business.

New York.—Local demand for Cut Nails is not quite so brisk as it has been. An advance in the price of Wire Nails at mill should be followed by a similar increase in the cost of Cut Nails, and will probably soon be reflected in jobbers' prices. New York jobbers' quotations are about $2.30 for small lots at store.

Chicago.—The week has developed a little better demand, a good portion of which comes from car repair shops, which are extremely busy. Prices are being well maintained at the recent advance. Quotations are as follows: Iron Cut Nails, car lots, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in car lots, $2.28; to retailers, $2.33.

Pittsburgh.—New orders in Cut Nails are rather light, but specifications on old contracts are coming in quite freely. The mills are now making prompt deliveries, having pretty well caught up on back orders. The supply of Steel and of cars is reported as very satisfactory. Prices are said to be maintained by the mills, but are occasionally cut by jobbers.

Barb Wire.—The American Steel & Wire Company made an advance in the price of Barb Wire of 5 cents per 100 lb., the change taking effect September 3. Specifications on contract orders are still being freely received by the mills, while new business is somewhat light, as usual at this season. Quotations in view of this advance are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

The new prices on Fence Staples, f.o.b. Pittsburgh, to jobbers, in carload lots, are as follows: Polished Staples, $2.15; Galvanized Staples, $2.45, with the regular differentials for smaller lots.

Chicago.—Mills are exceedingly busy on specifications against contracts, and while new business is rather light, it is unusual in amount for the season. Prices are advanced 5 cents per hundred weight. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New demand is somewhat light, but specifications against old contracts are still coming in freely, and shipments by the mills are heavier than usual at this season of the year. There is a full supply of Steel and cars, and the tone of the market is very strong. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Smooth Fence Wire.—An advance of 5 cents per 100 lb. was made by the American Steel & Wire Company on September 3. Fence manufacturers are freely specifying against contract orders, and demand for Fence Wire is heavy from various sections of the country. Quotations are as follows, f.o.b. Pittsburgh, 60 days or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The present strong demand will probably be strengthened rather than otherwise by the advance of 5 cents per 100 lb. announced by the American Steel & Wire Company. Besides heavy specifications on contracts, new orders are piling up a large amount of tonnage. Quotations are as follows: In car lots, to jobbers, $2.08 f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—Fence manufacturers are specifying freely against contracts, and are insistent upon prompt shipments, showing that stocks of Fencing are very light. Demand for Fence Wire is particularly heavy from the South, but is gradually extending to all parts of the country. Prices are firm, but without change. Quotations at the 5 cent advance are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95

The foregoing prices are for base numbers, 6 to 9.

Window Glass.—It is stated that according to semi-official authority the wage scale that has been formulated, and which the workers are said to be trying to keep from Glass manufacturers, provides for a restoration of wages on the first four brackets (an advance of from 10 to 25 per cent.); last year's wages are the next three brackets, and a slight reduction on the extreme large sizes, in double strength, which, it is explained, is reduced because of its displacement by polished Glass. The prospect of these demands explains why Glass manufacturers are not anxious to start their factories. It is stated that with but few exceptions manufacturers have decided to allow their plants to stand idle until December or January 1, rather than attempt to make Glass at the foregoing cost. Jobbers' stocks are regarded as being rather light, and it is estimated that stock in manufacturers' hands, including hand operating and machine factories, does not exceed 1,000,000 boxes, much of this in undesirable sizes. A meeting of the Western Window Jobbers' Association is scheduled for September 6. Local demand is very quiet and prices are reported as ranging, according to the anxiety of the seller, from 90 and 10 to 90 and 15 per cent. discount on single, and from 90 and 10 to 90 and 20 per cent. discount on double strength Glass. This is from the jobbers' list, October 1, 1903. Western jobbers' discounts are reported as being 90 and 10 per cent. discount for the first three brackets of single thick; 90 and 15 per cent. for other brackets of single thick and 90 and 20 per cent. discount for all sizes of double thick, from the same list.

Builders' Hardware.—While not by any means in bad condition, the market for Builders' Hardware is characterized by a somewhat less confident tone than has for so long a time prevailed. There is a good deal of earnest competition between the manufacturers for such business as is within reach, and prices are in some cases slightly shaded. While it would be a relief to merchants to feel assured that orders would be filled promptly, it is recognized that any serious falling off in the demand because of the curtailment of building would be probably attended by the development of lower quotations than those which have been so well maintained during the period of great activity, when the capacity of the manufacturers was taxed to the utmost.

Scythes.—It is reported that prices on Scythes which were announced September 1 represent an advance of 75 cents per dozen. Terms are said to be as usual, with the customary concessions to the different classes of larger buyers.

Rope.—Demand is on a comparatively moderate scale, fall requirements not yet being in evidence to any great extent. Manufacturers are filling contract orders. The market shows slight evidences of weakness, except on Jute products. Quotations are as follows: Pure Manila,

12½ to 12¾ cents; B quality, 11½ to 11¾ cents; Pure Sisal, 9 cents; lower grades Sisal, 7¾ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Sheet Metal Ware.—Manufacturers of Stamped and Pieced Tinware, Enameled Ware, Galvanized Ware, &c., held their regular conference last week at Saratoga Springs, N. Y. No important changes in price were made. Although there has been some decline in Tin, the manufacturers state that their prices were never made commensurate with the top prices on the raw material and therefore no reductions are likely at the present time. Galvanized Sheets are firm and business in lines of Galvanized Ware is exceptionally good, reflecting an increased consumption of these products. As a result prices are decidedly firm. Dripping Pans remain unchanged.

Linseed Oil.—Flax Seed has advanced about 10 cents per bushel owing to the uncertainty of the crop's condition, and has given the market a firmer tone. In some quarters the advance is attributed to fright of those who had sold ahead and who rushed into the market to cover their requirements. Oil that has been shipped by crushers on contract orders has been of sufficient quantity to reduce supplies. Large buyers whose contracts have expired are buying just enough to cover immediate requirements, until the future of the market becomes more certain. New York quotations for Oil, according to quantity, are as follows: City Raw, 43 to 44 cents per gallon; Out of Town Raw, 40 to 43 cents per gallon; Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—The market has fallen off about 1 cent per gallon during the week, as a result of a lower Southern market and limited local buying. New York quotations are as follows, according to quantity: Oil Barrels, 57 to 57½ cents; Machine Made Barrels, 57½ to 58 cents per gallon.

TRADE ITEMS.

"THE TONAWANDAS OF TO-DAY" is the title of an interesting folder issued by the North Tonawanda, N. Y., board of trade. It refers to the many manufacturing advantages possessed by the Tonawandas, and illustrates a number of the plants now located there. Illustrations of public buildings, residences, &c., are also given including a view of the interior of Knapp-Cramer Hardware Company's store, which is referred to as the "finest Hardware store in Western New York."

THE Broadway store of the Scott Hardware Company, Paducah, Ky., was damaged by fire on the 26th ult. The company states that this will occasion only temporary inconvenience, as its Fourth street store is well stocked and orders are being filled regularly. As soon as the injured premises are put in condition again the company will occupy them as heretofore.

TO FURNISH a strong selling point to merchants handling Bristol Steel Fishing Rods and demonstrate the company's faith in their durability and excellence the Horton Mfg. Company, Bristol, Conn., is guaranteeing its Fishing Rods for three years from date of purchase. If during that period any break occurs in the Rods, due to defective material or workmanship, the company stands ready to replace the part or parts without charge.

AMONG THE HARDWARE TRADE.

The Hardware store of W. N. Worthington & Bro., Aberdeen, Md., was recently destroyed by fire.

H. F. Leibsle, Sioux Falls, S. D., has purchased the business of Bolton Hardware Company, Des Moines, Iowa.

H. C. Chapin, who has been in the Hardware business at Union, Iowa, for 26 years, has sold out to Geo. Lepley, Jr.

The Rio Hardware Company, Rio, Wis., recently suffered a loss of $2000 by fire.

A CALIFORNIA STORE BOOKLET.

FROM far-off California we have received an effective booklet calling attention to a few of the lines carried by the Cole Hardware Company, Berkeley. The booklet is about 5 x 6¾ in. and comprises eight pages. One of the pages—the first—is reproduced herewith to give an idea of the typographical style and the breezy fashion in which the different subjects are treated. Besides Screens and Window Glass the pages relate to Garden Hose and Lawn Mowers, Carving Sets and Cutlery, Kitchen Ware, Wagons, Coasters and Go-Carts, Baseball and Tennis Goods, China and Glassware, and Mechanics' Tools. Price figures do not appear in the booklet, but the excellent quality of the goods featured is enforced. The public is frequently reminded, however, that Saturday is the store's bargain day, when a third off regular prices is always obtainable on one or more lines. The attractive front cover design is also reproduced. The inscription was to one side of the cover rather than in the center, leaving a margin to the right of 1¾ in.

Front Cover Design of Cole Hardware Company's Booklet.

WHEN your bouncing boy gets an idea he was made to be a carpenter and begins to practice on the window pane with a hammer, well—or when he becomes a baseball man and knocks a home-run through your parlor window,—why . . . or when the rolling pin misses your head and goes through the kitchen window pane just ring up Berkeley 359 and the Cole Hardware Company will fix it for you at short notice.
Window glass is one of our specialties. A house with a broken window won't rent or sell nearly as quick as one with windows in perfect order.
Did you ever awake
In the early morn
With bumps on your face
As big as toe corns,
And mosquitoes a-singing
Around your head
And whole flocks of 'em hummin'
Around your bed?
Why not guard against them?
We have the screens.

Page from Booklet Issued by Cole Hardware Company.—Actual Size, 5 by 6¾ In.

M. J. Tully has bought the interest of his partner in the Gislason Hardware Company, St. Peter, Minn., and will conduct the business in the future under his own name.

A GOOD TRAVELING SALESMAN.

BY D. S.

A GOOD salesman is composed of one part talk, and nine parts judgment, and he should use the nine parts of judgment to tell when to use the one part talk. Good judgment in the granting of credits is one of the things that go to make a valuable salesman. It is not altogether how much Hardware a man can sell, but how much profitable Hardware he can sell with a minimum of loss in bad debts.

The Three Requisites

that go to make a successful salesman, are shrewdness in argument, observation of buyers, conditions and surroundings, and honesty of speech. A man should know his goods—their weak points and their strong points. He should have confidence in his firm and their goods. His firm is paying him a salary to work for them, to talk for them. It is, therefore, his duty to get posted so that he may know where he is at. Every man and every firm will have their weak and good qualities. Make it a point to study up and post yourself on all the qualities they possess. Forget the weak points. You will hear enough about them anyway. Combat with sound argument any and all weak points brought up, with the good qualities you know, and it is ten to one that you will come out with the best of it.

Don't grumble. Always stand by your firm. Usually you will find if you will carefully investigate complaints of wrongs, overcharges and grievances that they are more fancied than real.

One Salesman's Experience.

A salesman reported to his firm that a competitor was selling certain goods much below his prices, consequently he could sell none unless he could have a competitive price. He hammered away about this so much his firm finally wrote him to send in a sample, which he did, and when he came in he was confronted with both articles. There was absolutely no comparison between them. He had to back down with the lame excuse that he had not seen the other goods, but had taken his customer's word for the price and quality. He should have made a comparison of the goods when the first complaint was made. He went away on his next trip with more nerve and more confidence, and took orders where before he let them go by default.

A Good Salesman Is a Close Observer

of his customer, for after all it is quite as important that goods are sold to people who will pay as it is that goods should be sold at a profit. A salesman must, therefore, become a credit man. He should make this as much of a study as the art of selling goods. Now, what makes a man or a firm a good credit risk? Money alone? No. A man may be an excellent credit risk with small capital, if he possesses good character and experience and makes good use of both.

Points About Customers.

Thees are the points: Does he understand his business? Does he pay close attention to his business? Does he keep his store and stock clean? Does he run his store, or let his clerks run it? Does he do a large cash business, or a large credit business? Do you always find him at his store, or usually have to wait for him? Does he keep books? Has he a good system? Any tab on sales? A reckless buyer? Extravagant habits? What is his general reputation? Has he an extravagant family? Post your house on these points in a general way and keep them posted on changes.

Confidence an Important Factor.

The most important factor in a salesman's success is the confidence of the customer. My observation has led me to believe that the customer will pay the seller a reasonable profit when the seller comes right out plainly and tells him that he has to have it and doesn't care to do business with him unless he gets it. A buyer loses faith in a man who doesn't stand firm on the prices at which he offers his goods.

The man who gets the best prices is the man who succeeds best and is the hardest to meet in competition. It is easy to compete with a seller who cuts the price because he is not a good salesman.

Cutting the Price.

A new man in business nearly always cuts the price or does things that have a bad effect on the trade as a whole. He suffers as much as the others, but doesn't know why until experience teaches him a severe lesson in the art of doing business on business principles.

The salesman who believes that he can sell goods at a wrong price without his action being discovered by competitors was never more mistaken. Not one buyer in a thousand will keep the secret. He is so proud of his achievement that he will tell the first competitor that comes along all about how he "worked" the other salesman down in price.

It is better to lose some business than to lose the profit on all business. I have never known a salesman who had the courage to refuse unprofitable business, who failed to get an abundance of business of the right kind in the long run.

THE PARCELS POST QUESTION.

S. H. CRANE, Chicago, a veteran Hardware merchant, compiler of the first Hardware jobbers' catalogue, who will be remembered by many in the trade as a member of the firms of Markley, Alling & Co., and John Alling & Co., makes the following comments on the new developments in connection with the parcels post agitation:

Your editorial of August 22 on the attitude of the new Postmaster General, George Von L. Meyer, to the much talked of parcels post proposition, will naturally rally the retail Hardware dealers, singly, and in their associations, to united efforts to prevent the passage of the parcels post bill which may come up at the next Congress. This is not a financial measure. The Government of the United States can gain or lose and the average citizen is not affected. It is simply a question of justice to all.

The arguments favoring the measure will call for Congressional wrath and punishment to the great express corporations, and thereby cause a saving to the farmer, the artisan or the citizen who sends or receives few or many parcels. The arguments against the measure are that it favors a few dealers at the expense and detriment of the many. Seemingly, the bill is for the special benefit of catalogue and mail order houses, who, while they keep within the pale of the law, harrass and do evil to the thousands of retail merchants, in all lines of trade, in all parts of America. Compared with them, in the eyes of the retail mercantile trade, the sins of the Standard Oil Company are as nothing. Why should they be favored by legislation? And the farmer does not need it. The Lord of the Harvest promises him that "seed time and harvest shall not fail," and it never fails. He is the only independent and always prosperous citizen of the republic.

The retail merchant is a necessity. Numerically he is the direct outlet from the manufacturer and producer to the consumer. As a rule, his capital is small, his credit is good, he is certainly worthy of his hire and his only promise is "blessed are the pure in heart."

Parcels post is a European idea and said to work well in European countries. Can it be a success in Great Britain and other thickly settled countries, and a costly burden in America? Let us look into the territorial area and population.

Great Britain has 121,377 square miles, 41,458,721 inhabitants, or 341.52 to the square mile.

France has 207,054 square miles, 39,118,995 inhabitants, or 188.10 to the square mile.

Germany has 208,830 square miles, 56,367,178 inhabitants, or 269.9 to the square mile.

The United States has 3,616,484 square miles, 79,900,384 inhabitants, or 26.6 to the square mile.

The railroad mileage in 1906 of these several countries was as follows: Great Britain, 23,070; France, 28,102; Germany, 33,000; United States, 217,341. Great Britain, France and Germany combined have 84,172 miles of railroad to cover 537,201 square miles of territory, or 1 mile of road to 6.38 square miles of area, while the United States has 217,341 miles to cover 3,616,484 square miles of territory, or 1 mile of road to 16.12 miles of area.

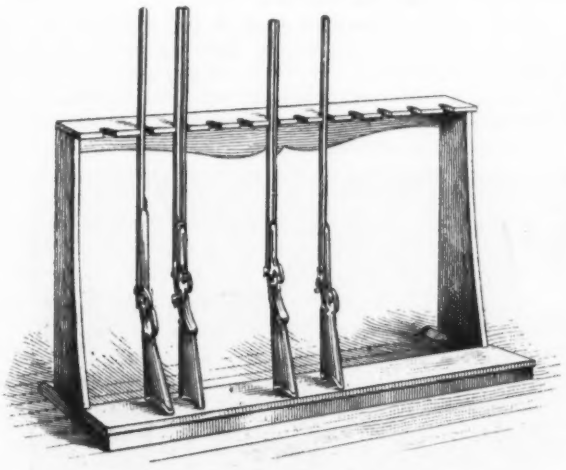
These figures show how absurd it would be to attempt to put the proposed parcels post in operation in this country in the expectation of realizing the same results as abroad.

Hardware Window Display

Twenty-second Article.

GUN AND HANDLED AXE RACKS.

THE Racks herewith shown are home made, and in use in the store of the Fox Cycle & Hardware Company, South Norwalk, Conn. The Gun Rack is 4 ft. long, 31 in. high and 14½ in. wide at the base. The end uprights are 6½ in. wide at the bottom and 3 in. wide at the top. The board with notches for the Gun Barrels is 3 in. wide, and the bottom board upon which the butts

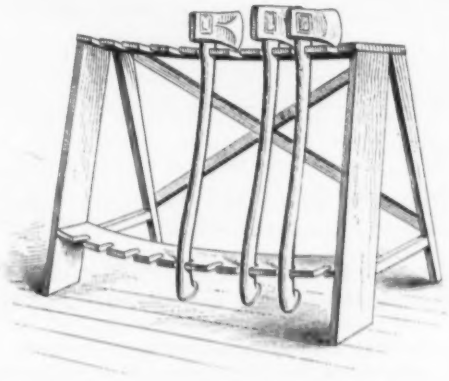


Gun and Rifle Rack.

of the Guns rest is 5½ in. wide. The Rack is made of ½ in. stuff, cherry stained, and accommodates 12 Guns and Rifles. It is located at the back of the show window, facing the sidewalk. It displays the Firearms to good advantage, without obstructing the view of the interior of the store.

Handled Axe Rack.

The Rack for Handled Axes has end pieces 6 in. wide, 29 in. high and 27 in. apart. The pieces at the back supporting the Rack are 1½ in. wide at the top and taper to ¾ in. at the bottom. The distance at the bottom between the front and back pieces is 9 in. The front and back supports are braced at both ends of the Rack by

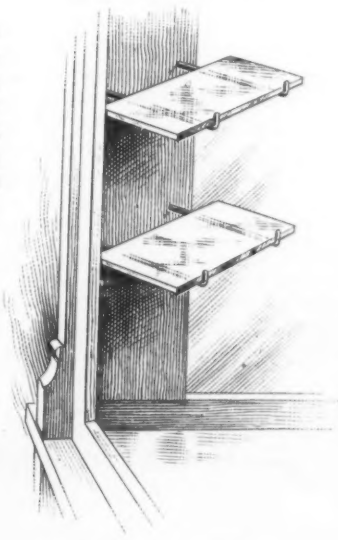


Handled Axe Rack.

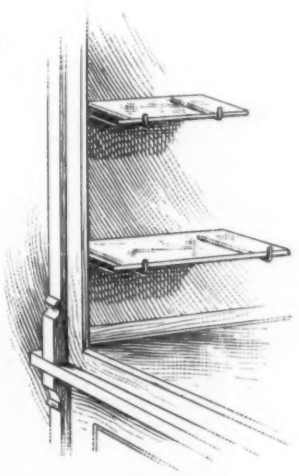
cross pieces, and the back supports are also braced by two pieces at top and bottom, crossing in the center. The circular shaped boards, with notches for the Axe Handles, are 16 in. apart, and the lower one is 12 in. from the floor. The distance from the center of the back of the top circular shaped board to a straight line drawn from the end supports is 3½ in. The bottom board has the same bow. The material is ½ in. thick, cherry stained. The Rack accommodates eight Axes, and displays them to much better advantage than if laid on the floor of the show window.

GLASS DISPLAY SHELVES.

The accompanying sketches indicate a method of erecting glass display shelves in the front of a window suggested by D. B. Wilson Company, Waterbury, Conn. One sketch shows the shelves occupying a corner where



Glass Shelves in the Front Corner of a Window.



Glass Shelves on Side Wall.

front and side glass join; the other shows how they may be put up close to the glass on a side wall.

Glass Shelves

The shelves should be made of thick plate glass. As they merely rest on two wire hooks, they may be put up with very little trouble and may easily be taken down if temporarily in the way. They afford an excellent opportunity to display handsome articles separately and prominently without obstructing the view of things behind or in any way lessening the effect of a central display.

DISPLAY STAND.

A convenient and inexpensive stand which may be adapted for the display of several lines is shown in the accompanying illustration. It is 3 or 4 ft. high and is built with a slanting face on which, at regular intervals,

Display Stand with Packages of Garden Seeds Resting on Picture Molding.

are tacked lengths of picture molding. As employed by

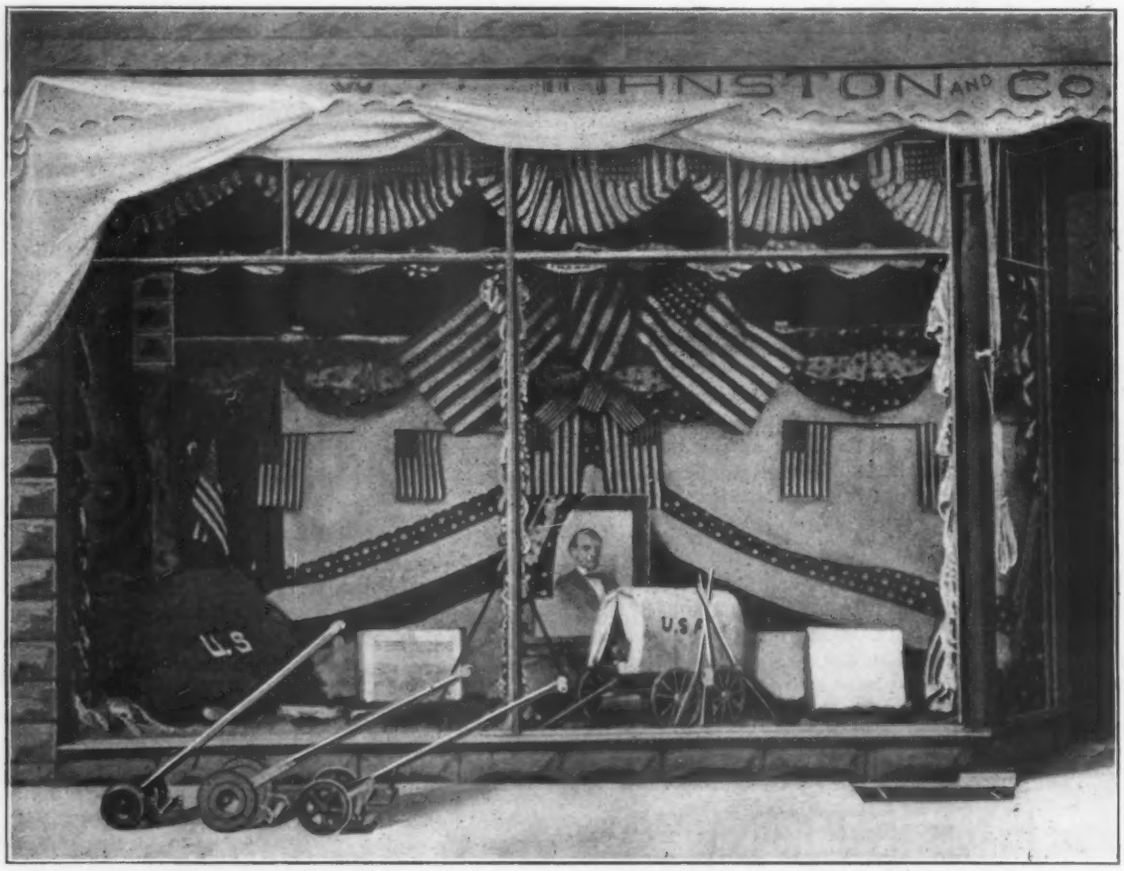
Ingenious Stand

I. P. Terry & Son, Ansonia, Conn., the device is used as illustrated for accommodating paper packages of Garden Seeds which are of uniform size and general appearance. Numerous other articles, however, may be displayed on such a stand, either resting on the molding or suspended from it by hooks. The stand may be finished to match any wood, or painted, or may be covered with black or other dark cloth before the molding is put on.

The McKinley Hardware Company, Lorain, Ohio, has increased its capital stock from $10,000 to $15,000.

A MICHIGAN STORE'S HOLIDAY WINDOW.

THE Memorial Day window exhibit made by W. H. Johnston & Co., Leslie, Mich., is reproduced herewith. It was not characterized, it will be observed, by much in the way of Hardware, but the exhibit was tastefully arranged and appropriate to the day. It proved to be an effective window so far as catching the eye of the public was concerned and was doubtless an efficient reminder of the firm and its business. The window is of large proportions, being 15 ft. long by 6 ft. in depth. The floor of the window was covered with real grass sod, as was also the bank at the left. This bank was gotten up to represent a fort and a cannon made of Wire Cloth occupied a place on the top. In the window front were an army wagon, built on the lines of those used during the Civil War, several tents, cartridges, old swords and a stack of .22 Rifles. At the back was a picture of President Lincoln, in a setting consisting of flags and bunting attractively disposed. The exhibit was designed and arranged by John Tiplady, one of the clerks employed in the store.



Window Exhibit of W. H. Johnston & Co.

A SELLING COMPANY FOR SCREEN WIRE CLOTH.

NEWS of special interest to the Hardware trade developed from a meeting held in Chicago on Monday, August 26, by a body representing a number of the manufacturers of Wire Cloth. A company with a capital stock of $25,000 has been organized and incorporated in Illinois under the name of the American Selling Company, for the purpose of handling the entire output of the factories which will market their product through this channel. The meeting referred to had for its object the election of officers, and completion of details connected with the organization of the new company. Pending formal announcement of the establishment of the American Selling Company as a central selling agency together with its plan of operation, the names of its officers and directors elected at this meeting are withheld. Several important manufacturers in this line have declined to identify themselves with this movement. The offices of the American Selling Company will, it is understood, be established in Chicago. Another meeting of those interested in this organization will be held in the near future, when it is expected its plans will be fully developed and made known.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM JOHN W. PARTON, who has engaged in the Hardware, Stove, Implement, and Paint business, at Bayard, Neb.

FROM WILLIS & MCCREA, successors to the Shelf and Heavy Hardware, Stove, and Implement business of Willis & Mowry, Manchester, Tenn.

FROM KLEIN HARDWARE COMPANY, Oklahoma City, Okla., which has bought the business of W. G. Wright.

FROM HALBERT & WEBBER HARDWARE COMPANY, which has been incorporated at Wenatchee, Wash. On November 15 the company will move into a new and larger building and will increase its lines.

FROM D. F. ANDERSON & SONS, Rosalia, Wash., who have incorporated with a capital of $20,000.

FROM ROW HARDWARE COMPANY, which has succeeded to the general Hardware, Vehicle and Saddlery business of Boyd & Row, Larned, Kan.

Blunt Hardware Company, Skowhegan, Me., will shortly move into a fine new store which is being prepared for its occupancy.

Parcels Post Boomers Hard at Work.

WASHINGTON, D. C., September 3, 1907.

POSTMASTER-GENERAL MEYER'S recent declaration of his intention to recommend to Congress the authorization of an experimental parcels post has already begun to bear fruit, and it is a foregone conclusion that the coming session of Congress will witness the most spirited contest on this question that has ever marked this paternalistic movement. That the parcels post promoters are fairly well organized and provided with a considerable fund is evidenced by the work they have done since General Meyer made his original declaration at Nantasket Point, Mass., but three weeks ago. The press reports of his speech on that occasion and the interviews which he subsequently gave in New York have been reproduced in facsimile by photolithography and are being widely circulated, accompanied by copies of bills pending in the late two congresses designed to carry out various features of the Postmaster-General's recently announced policy.

Thus far this parcels post literature has been circulated amonymously, but its form and appearance show conclusively that it emanates from a common source, although the envelopes containing the matter received here are variously postmarked to indicate that they were mailed at New York, Boston and Washington. The fact that none of this literature appears to emanate from Chicago is interesting, but to those familiar with this movement indicates merely that the promoters desire that it shall not be attributed to the great catalogue houses located in that city.

The Henry Bill.

Bearing the label, "Favored by Postmaster-General Meyer," the Henry bill (H. R. 4428, fifty-ninth Congress, first session), is the important document included in the literature now being distributed. This bill has for its ostensible purpose the placing of the rural free delivery service "on a paying basis," and authorizes rural carriers to handle parcels of all kinds up to 200 lb. in weight and in dimension up to a barrel. The rates provided by this bill range from 1 cent for an 8-oz. parcel up to 25 cents for a barrel weighing 200 lb.

This bill was originally introduced in Congress December 6, 1905, by Congressman Henry of Connecticut, who for a number of years has been the principal advocate of a domestic parcels post and who is the author of the now famous Henry bill authorizing the carrying in the mails of parcels up to 11 lb. at rates ranging from 1 cent for 4 oz. up to 25 cents for the maximum weight. The provisions of Mr. Henry's measure were closely followed when the so-called Hearst bill was drafted, but inasmuch as Mr. Hearst will not be a member of the new Congress, Mr. Henry will be generally recognized as the leader in this movement, and his bill, which will be reintroduced when the new Congress convenes, will no doubt be selected to be urged upon the attention of the House Post Office Committee.

Representative Ellis's Bill.

Although apparently emanating from the same source, another and more conservative measure pending in the last Congress has been reprinted by the parcels post boomers and is being widely circulated. This is the bill (H. R. 10,066) presented in the House January 4, 1906, by Representative Ellis of Missouri and designed to carry out the recommendation of former Fourth Assistant Postmaster-General Bristow. It provides:

That upon all mail matter of the fourth class, as now defined by law, in packages, properly prepared for mailing, not exceeding five pounds each, and mailed at a distributing post-office for a rural free delivery route, or at any point on such route by delivery to the carrier thereof, addressed and for delivery to a patron of and upon such route, the rate of postage shall be 3 cents per pound or any fractional part thereof. The Postmaster-General shall prescribe special stamps of appropriate designs and denominations, and shall promulgate such rules, regulations and safeguards as will promote the service hereby created, and prevent abuses thereof.

In support of this bill a short printed memorandum is being circulated which embraces the following extract from the last annual report submitted by General Bristow:

NEW RATE OF POSTAGE NEEDED.

With the establishment of rural mail delivery, and the increasing extension of rural telephone service by private interests, there has grown up a demand by the patrons of the rural service for the delivery of small packages of merchandise, such as food stuffs, tobacco, dry goods, drugs, &c., on an order to the local merchant by postal card, telephone, or otherwise. The value of these packages of merchandise is usually small, and the present rate of postage of 1 cent per ounce is practically prohibitive. The patron or merchant cannot afford to pay 16 cents for the delivery of a pound of coffee or tobacco, or similar article, but if a special rate were established on such matter from the distributing office for delivery to any patron on the rural routes from that office, it would be a great convenience to the patrons and become a source of revenue to the Department.

It is, therefore, recommended that the Congress fix a rate of 3 cents per pound, or any fractional part thereof, on packages of books or merchandise not exceeding five pounds, mailed at the distributing post-office of any rural free-delivery route for delivery to a patron on said route. This rate should apply only to packages deposited at the local post-office for delivery to patrons on routes emanating from that office, and not to mail transmitted from one office to another. The rate of 3 cents per pound would be ample remuneration for the Department, because there is no expense for railway transportation, and the system by which these packages are to be delivered is already established, and such delivery would entail no additional expense upon the Department. A special stamp could be provided for this class of mail matter.

Would Circulate Catalogues Cheaply.

When General Bristow presented this suggestion to Congress it was at first favored in some quarters by those who were opposed to a domestic parcels post, but who thought that the passage of such a law would, perhaps, relieve the pressure for a more comprehensive service, and it was, therefore, the subject of some favorable comment. Subsequent investigation, however, demonstrated that it was being strongly urged by certain mail order houses, which, it was stated, desired to take advantage of the proposed privilege for the distribution of their catalogues. The Bristow plan was well suited to this purpose. It would enable the catalogue houses, which might ship their catalogues in bulk to agents located in towns and villages from which rural routes radiated, to have them mailed at such post offices and delivered by rural carriers at a cost for postage of 12 cents for a 4-lb. package, instead of 32 cents, which is the present rate. Allowing, say, 5 cents for freight, agent's commission, &c., there would thus be a saving of 15 cents on each book, or nearly 50 per cent. of the present cost of distribution. In many cases agents would be willing to take their commissions in merchandise, as was the case with rural carriers before the enactment of the law prohibiting them from acting as agents, and the saving would thus be still further increased.

The Denny Bill for "Experimental" Parcels Post.

Another measure now being circulated with the indorsement of the Postmaster-General is the so-called Denny bill (H. R. 7362, Fifty-eighth Congress, first session). This bill authorized an appropriation of $100,000 for an "experimental" parcels post to be operated between New York, Philadelphia, Baltimore, Washington and several Western cities to determine the practicability and cost of handling general merchandise in the mails. The Denny bill was strongly favored by the Postal Progress League, the catalogue houses and a few large department stores doing a mail order business. The House Post Office Committee, though repeatedly urged to take it up, declined to do so, having in mind the rural free delivery "experiment," which even at that time had grown from $10,000 to more than $15,000,000. For the coming year it will exceed $35,000,000. A strong effort was made in the closing hours of the Fifty-eighth Congress to force the Denny bill on to the annual Post Office Appropriation bill as a rider, but this was stoutly resisted in both House and Senate, and the bill was so decisively defeated that it was not even reintroduced in the last Congress. It is evident, however, that it will be revived next winter if, indeed, it is not superseded by a more radical measure having the specific indorsement of the Postmaster-General and perhaps drafted by officials of the Department.

Rumor Concerning the National Grange.

A well defined rumor is current here that the National Grange, Patrons of Husbandry, will take an active part in pushing the parcels post propaganda next winter. This organization, which is claimed to have 1,000,000 members, two years ago decided to inaugurate a campaign for a domestic parcels post and appropriated $10,000 from its treasury for that purpose. Subsequently, however, the Grange became interested in the fight for the passage of a free alcohol bill in the interest of the farmers of the country and concentrated its energies in that direction, with the result that a measure which had been pending for no less than 22 years was finally forced through in June, 1906. When the next session of Congress began it was found necessary to ask for supplemental free alcohol legislation, and this movement, which terminated successfully, again occupied the attention of the Grange to the exclusion of other matters. It is now reported that the Grange will take up the subject of a domestic parcels post next winter, and will make one of its characteristic "whirlwind" campaigns in its interest. There is a strong conservative element in the organization, however, that is opposed to the proposed parcels post crusade, on the ground that it would be futile, and that strongly favors a campaign for large Federal appropriations for good roads. In a good roads campaign the farmers would have the hearty co-operation of retail merchants everywhere, and the outlook for success under such auspices would be very flattering. W. L. C.

Relation of Retail Merchants' Selling Prices to an Advancing Market.

IT is, of course, recognized as a business principle, that when a retail merchant purchases any line of goods at an advance on the last price paid for them his selling price to the consumer on the goods so bought should be advanced commensurately, so that they may bear their proper share of the store's expenses and yield some profit besides. This is on the assumption that his selling price was such as to cover only a reasonable profit, and that the increased cost of the goods to the merchant is of more than trifling amount. It is not, however, an easy matter, except perhaps in the case of staples on which the margin of profit is small, to advance retail selling prices, as in many instances the merchant is fettered with conditions and circumstances which militate against it. Some of these are noted below in extracts from letters on the subject which have been received from representative retail merchants in different sections of the country. They will be of interest as indicating the way in which this important question is regarded by merchants of recognized ability and standing:

Prices Should Not Be Changed Unless Advance Is a Large One.

FROM A MONTANA HOUSE: Prices should be advanced with the rise of the Hardware market on all goods that are sold at a close margin. On goods sold at better profits the advance should not be made, unless the difference in old and new quotations is very great. We find there are a great many goods which cannot be advanced, owing to the different views of merchants. Advancing prices of some goods in the middle of the season is always detrimental to general trade.

Advance on Staples Only.

FROM A MERCHANT IN TEXAS: We believe that selling prices should be advanced in sympathy with the increased cost of goods on staples only, except when stock in Shelf Hardware must be replenished at increased cost. Advances should then be made on the part of the line bought at old prices, to correspond with the part bought at the new prices, if competition permits.

Hard to Explain Price Fluctuations to the Consumer.

FROM A MINNESOTA FIRM: We certainly think that Hardware merchants are justified in raising the selling prices of their goods whenever there is an increase in cost, whether they have the goods on hand or have them to purchase, for they are expected to reduce the price whenever the cost declines. Of course, retailers cannot change their prices to meet all the fluctuations in the market, but to advance their prices the advanced cost to them should be substantial and likely to remain in force for a reasonable period of time, for a country merchant in distributing goods to the consumer has to take a medium position, as it is hard to explain the fluctuations in the prices.

Competition Has an Important Bearing.

FROM A HOUSE IN ARKANSAS: The proper way would be to advance selling prices with advance in the market, and mark down with decline in market. As we take it, we have a certain amount of goods on hand which have to be kept up. Now, if we sell part it has to be replaced, and at whatever price we can do this is the market price, and the selling price should be regulated accordingly.

In practice, however, we have to deviate somewhat from this, as some of the advances in goods cannot be marked on selling price as long as a considerable stock of the goods may be in our city and some of our competitors sell on basis that the goods cost them at old prices. So, in a general way, advances as well as declines in selling prices will make their appearance a little after the changes occur in the wholesale market.

Adapting an Old Maxim.

FROM MERCHANTS IN NORTH CAROLINA: We believe retail selling prices should follow in close sympathy with a rising market, but under existing conditions we are forced to follow an old maxim, if we quote same correctly: "Do not be the first to take up the new or the last to put down the old." With the competition we have be not the first to put up prices, provided you have same in stock or contract ahead of advance, or the last to put down prices.

Each Merchant Must Judge for Himself What to Advance and What Not To.

FROM A NEBRASKA HARDWAREMAN: In any unusual advances, as at present, we re-mark quite a portion of our stock, even if bought at lower price. There are many articles, however, that cannot be priced higher and are sold at old prices and nothing said about it. Everybody must judge for himself what to advance prices on and what not to.

Advancing Prices Curtails Business in Some Lines.

FROM A TENNESSEE HOUSE: We think a merchant should advance prices, but if competition is keen our experience is that he rarely ever does it on what he has in stock. It is a very hard proposition to advance price to consumers, and when it is done curtails some business on some lines.

This Merchant Confers with His Competitor.

FROM A WISCONSIN HARDWAREMAN: The merchant should always follow the market. Our selling price is based on an article's value, and when the value changes the selling price should change. We know the mania for selling cheap will often hold the price down until the supply in hand purchased at a lower price has been exhausted. We are in a small town and if there is any radical change we see our competitor and fix the price.

Under Certain Conditions Sells at Old Price and Uses It as Advertising.

FROM A HOUSE IN INDIAN TERRITORY: Goods should always be advanced with the market and this means both goods coming in and goods in stock. We follow this on most everything unless sometimes we have a good stock of some article and we know our competitors have not, in which case we very often continue the former price, at least until old stock is most exhausted. We do this and always talk it to our trade, telling of the advance, &c., and use it as an advertisement against our competitors, and especially do we do this when we know that they are obliged to get a higher price.

Where the Margin Is Small Price Should Be Advanced.

FROM A NEW YORK STATE FIRM: There are many items in our line where the margin of profit is rather small, and on such items it is positively necessary to advance the selling price to correspond with the advance in cost. There are many items that have been sold for years at a standard price of 5, 10 or 25c., &c., for which the re-

tailer hesitates to ask more when the cost to him advances, so that his profit is reduced so much. We believe that in goods that follow the market closely we should take advantage of the advance on the goods in hand to offset the decline when there is a slump in the market.

Retail Prices Should Be Disturbed as Little as Possible.

FROM A HOUSE IN VERMONT: We have not been in the habit of advancing our general line of prices on a rising market until such advances have become firmly enough established to justify us in doing so, or until obliged to by our stock bought at lower prices being closed out. This, of course, does not apply to staples like Nails, Wire, White Lead or Linseed Oil. On this class of goods, which sells at a very close margin of profit, we follow the market closely.

We believe, however, in disturbing retail prices as little as possible, as the smaller profit made by selling at the same prices on an advancing market will be offset by sales at the same prices on a declining market. This is supposing that a merchant is fortunate enough to stock up before an advance and to run his stock low when a decline is anticipated.

Getting a Reputation as the Cheapest Place in Town.

FROM AN ALABAMA FIRM: While we as a rule advance our price as the cost advances, we often anticipate an advance and stock up on some staple which we let go at the old price until stock is near normal, and in that way secure the name of being "the cheapest place in town." However, we often find that some things do not advance enough to warrant our increasing our price, which often cuts into our profits when the article in question is some thing that we sell a great deal of. We must say that it has been proved to us time and again that the people are not very much opposed to paying more for goods, for they have learned by this time that the goods that have not advanced in price are few and far between and they are expecting it.

Not Always Possible to Obtain Advance at First.

FROM A MISSISSIPPI MERCHANT: We think it good business practice to advance selling prices with the market as nearly as possible. We appreciate the fact that it is not always possible to get the full advance at first, but customers soon become advised as to the general advance and are willing to pay it. We certainly think a good merchant would get some advance on goods purchased at a lower figure, as the margin of profit is very small in these days, and one should take advantage of every opportunity of this kind to increase his profits.

Reasons for Not Advancing Prices.

FROM AN ARKANSAS HARDWARE MERCHANT: It would of course be much better if everybody would sell at the market price, but as they do not I say as an individual Hardware merchant—one who is up against strong competition—that it is not best to advance prices until stock is exhausted or the advance well established. We seldom have to reduce our prices on articles until we have had an opportunity to dispose of what we have on hand, as our competitor is as anxious, as a rule, to sell his stock before reducing the price as we are. I also figure on getting a certain per cent. of profit on stock in store. I notice when the jobber has notice that some item will advance, say 30 days hence, he takes particular pains to inform his traveling salesmen, and at the same time instruct them to push their sales on that particular line. If my position is wrong, the jobber would instruct his salesmen to stop selling these particular articles until after the advance. The same principle applies to the retail trade.

An Appeal to Brother Merchants.

FROM A COLORADO HOUSE: In this matter we take the position that the retail Hardware merchant should be prompt in following an advancing market in the sale of his goods, as competition will surely compel him to follow a declining market with reasonable promptness. We think the present a very propitious time for the Hardware merchants to discuss the price question, for with all the general prosperity we find it hard to realize the net profit our increased volume of business and capital would seem to justify. We hear the remark from brother dealers that it is awfully hard to make any money on the advancing markets with landlord, employees, light companies and printers as aggressive as the manufacturer in demanding more money. We retailers have been too weak kneed in keeping up with the market as well as too lax in keeping posted on the value of goods bought in large quantities before the last several advances.

We make frank admission of having just received Wagonwood stock, some parts of which cost us 10 to 15 per cent. more than we were selling same for last week. Let us advance with the market. It is just good business, and the only way to insure fair remuneration on investment and good, hard work.

Present Market Favors Manufacturer and Not Retailer.

FROM A HOUSE IN ILLINOIS: Ordinarily advances and declines offset one another, and in the long run about even matters up, so that if the retail merchant does not follow the market closely with his stock he neither gains nor loses. However, the conditions at the present time and for the past year are very exceptional, everything having advanced heavily. Therefore, if the selling prices are not changed accordingly, there will naturally be a great shrinkage in the profit account. In fact, so great have been the advances in some lines that if the selling prices were not immediately changed new stock would show an actual loss.

While it is natural enough in all seasons to change the price of Nails, Wire, White Lead, Oil, &c., to conform with market prices, in ordinary times Shelf Hardware does not justify many changes, but where the cost advances from 25 to 50 per cent. it is absolutely necessary to change the selling prices on Shelf Hardware in many instances.

Of course there are a great many items which sell for 5 and 10 cents on which the selling price cannot be changed, and in times like these it simply means the manufacturer's gain and the retailer's loss, whereas, on a declining market, the retailer receives the benefit. In fact, strictly speaking, this is the manufacturer's inning, whereas, on a declining market, when prices are more normal, the average retailer makes a better percentage of profit; in fact, as great or greater net volume of profit on ordinary business than on a larger amount during high price periods.

Advancing Prices Can Be Overdone.

FROM A WISCONSIN MERCHANT: There are many things the retailer has to consider in pricing his goods. Where we have home competition we must pay some attention to that on goods of a like nature or identical with what our neighbor sells. Then we dare not get too high above the prices of the catalogue houses, for their prices are all carefully gone over by the agricultural class. In fact, the catalogue is their encyclopædia, and no doubt more read by the farming class than any other book. If demand and supply is the cause of advancing prices and goods remain firm in price, I think the retailer should advance his prices not only on new shipments but on stock which he purchased on a lower market. In my opinion if the retailer should advance his prices to the same extent as the manufacturer and jobber, trade would drop off in a marked degree, and if this advancing market continues it will surely be detrimental to trade.

A firm market is much more desirable than a little decline all the time and much easier to sell goods on. But things can be overdone, as I believe has been the case on a great many articles the price of which has been advanced much more than justified by the increased cost of material and labor. I have noticed times in the past few years, or since trusts have become stronger and prices on some goods advanced from 50 to 80 per cent., that buying has been cut off considerable. A firm market with an advancing tendency stimulates buying, but when the price gets above a certain point the agricultural class quit purchasing, and I believe that time will come within the next six months, if prices keep soaring.

The demand seems good now on everything and shortages on many goods are reported. The small retail dealers throughout the country are not marking up their goods purchased previous to recent advances, but when they get in new supply will be compelled so to do. Then is the time they will find out if the buying public will pay advance or wait for lower price. Groceries and wearing apparel are lines the sale of which will not greatly decrease as a result of high prices, but there are many things in the Hardware line that people will get along without, if prices soar too high. The old Cook Stove, that has served its time, will be used another year or so, and they will not purchase a Steel Range when they come in and find price $5 to $7 more than their neighbor paid for the same thing. Building Material, and in fact a great many other things, will be cut out, if they go too high.

THE ROGERS & BALDWIN HARDWARE COMPANY, Springfield, Mo., has increased its capital stock from $150,000 to $175,000.

Business Methods in a Builders' Hardware Store.*

CONCLUDING ARTICLE.

Order Sheet.

Fig. 10 represents order sheets of white paper on which all orders are sent and of which a carbon copy on corresponding buff sheets is retained. When an order is taken by a traveling salesman a copy of the order on one of these sheets is given him, without regard to whatever memorandum he may have made in his order book. The sheets are 8½ x 11¼ in. in size and are numbered consecutively in the right hand corner. The date when the goods are received is marked on the copy retained in the first column. If the goods are for stock "S" is placed in the second column, or if to fill an order "C," to indicate charge, is put in the place of "S," after the charge is made on a ledger card from a charge sale ticket.

In case the goods are charged to a customer the date upon which an invoice is sent him is put in the third column. The use of this system of checking the charging of goods has prevented, as far as is known, any goods being delivered without being charged.

Filing Catalogues, Price Lists, Etc.

For keeping catalogues, circulars, &c., a cabinet is used, with a large table and chairs conveniently near, on which catalogues may be comfortably examined. The upper section of the cabinet is high enough to take jobbers' and manufacturers' large volumes, stood on end, and is divided into compartments numbered from 1 to 9. Hinged doors protect the books from dust. Below the doors is a series of drawers, with compartments or bins of various sizes, numbered from 1 to 77. These are designed for smaller sized catalogues and pamphlets, stood for the most part with the backs up, with perhaps half a dozen catalogues in a bin. The lowest drawer has but two compartments and is designed for large sized, thin catalogues, which lie flat on the bottom of the drawer.

Two smaller drawers conveniently located are provided for holding the index cards shown in Figs. 11 and 12, which are white, 4½ x 7½ in. in size. In Fig. 11, for instance, is shown a catalogue index card containing the name and the location in cabinet of Joseph Bardsley's and Bommer Brothers' catalogues, while Fig. 12, filed under Hinges, shows that both these concerns are manufacturers of Floor Hinges. Thus, whether a particular catalogue or the source of supply of a special line of goods is desired their location in the file can quickly be found.

While the cabinet and catalogues are primarily for the use of the firm, their usefulness is not restricted to this alone, as their free use is placed at the disposal of the firm's customers. The aim is to have catalogues, and at least approximate prices, of everything in metal which enters into the building trade, so as to be able to give customers quick information. To show how this consideration on the part of the firm works to its advantage one instance may be cited. A short time ago a contractor wanted to bid on a factory building, the specifications

R. A. REYNOLDS & SON, "Builders' Hardware"

CORNER MAIN AND SUMMER STREETS

PLACE THIS ORDER NO. ON YOUR INVOICE

No 1000

Stamford, Conn., Dec 12th 1906

To Russell & Erwin Mfg Co.
43-47 Chamber St, N.Y.

PLEASE ENTER OUR ORDER FOR, AND SHIP US AT ABOVE ADDRESS, GOODS AS FOLLOWS:

Quantity		No.	DESCRIPTION	Received	Charged	Invoice
2	dz	11½	Maydole Hammers	12/6	S	
6	set		Russell Jennings Bits	"	"	
1	dz	112	Disston Rand Saws 26" 8 pt.	"	"	

Ship via _____

Yours respectfully,

_____

Fig. 10.—Order Sheet.

LETTER Bo

FINDING LIST FOR CATALOGUES.

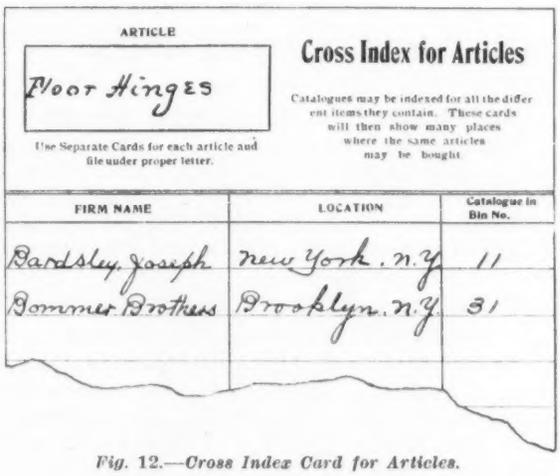
(Make the same division of letters that is made in the card index.)

NAME OF FIRM	CATALOGUE IN BIN NO.
Bardsley, Joseph	11
Bommer Brothers	31

Fig. 11.—Catalogue Index Card.

* This series of articles relating to the business system adopted in the store of Robert A. Reynolds & Son, Stamford, Conn., was began in our issue of August 15.

for which called for a particular make of Sash operating ventilating system, about which he knew nothing. From the catalogue cabinet he was able to get full in-


ARTICLE

Floor Hinges

Use Separate Cards for each article and file under proper letter.

Cross Index for Articles

Catalogues may be indexed for all the different items they contain. These cards will then show many places where the same articles may be bought.

FIRM NAME	LOCATION	Catalogue in Bin No.
Bardsley, Joseph	New York, N.Y.	11
Bommer Brothers	Brooklyn, N.Y.	31

Fig. 12.—Cross Index Card for Articles.

formation regarding the system, and from the data at hand the firm was enabled to make him a price, the result being that the firm supplied the goods.

The Trades 100 Years Ago.

Sixth Article.

The following article with the accompanying illustration is taken from the "Book of Trades, or Library of the Useful Arts," which was published in 1807 by Jacob Johnson, London, and at that time for sale in his bookstores in Philadelphia and Richmond, Va.

The Smith.

A smith is one who works on iron, and who from that metal manufactures a vast variety of articles useful in the arts of life and of great importance to domestic comfort. There are several branches in this trade; some are called blacksmiths, and of this class is the man represented in the plate; others are called whitesmiths or brightsmiths; these polish their work to a considerable degree of nicety; some include in their business bell hanging, which is now carried to great perfection; others are chiefly employed in the manufacture of locks and keys.

In the smith's shop there must be a forge, an anvil and block, a vise fastened to an immovable bench, besides hammers, tongs, files, punches and pincers of different sorts.

The forge is the most prominent article; it is represented in the plate on the right. The forge is a sort of furnace intended for heating metals so hot as to render them malleable and fit to be formed into various shapes. The back of the forge is built upright to the ceiling and is inclosed over the fireplace with a hovel, which leads into the chimney to carry away the smoke. In the back of the forge against the fireplace is a thick iron plate with a pipe fixed to it to receive the nose of the bellows. The bellows are behind the forge; these are worked by means of a rocker, with a string or chain fastened to it, which the smith or his laborer pulls. One of the boards of the bellows is fixed, and by drawing down the handle of the rocker the movable board rises and by means of a weight on the top of the upper board sinks again, and by this alternate motion the fire is raised to any degree of heat.

In the front of the forge and a little below it is a trough of water, which is useful for wetting the coals to make them throw out a greater heat; the water serves also for cooling the tongs, with which the smith holds the heated iron, and which in a short time become too hot for him to grasp. The smith likewise hardens his iron by dipping it while red hot in the water trough.

The smith in the plate is represented in the act of forging a piece of iron which he has just taken from the fire with the tongs in his left hand. Iron is hammered or forged two ways: Either by the force of the hand, in which there are sometimes several persons employed, one holding and turning the iron and hammering likewise, while the others hammer only with what are called sledge hammers, such as that which stands on the ground of the plate resting against the block, or it is done by the force of a water mill, which raises and works several enormous hammers. Under the strokes of these the men have only to present the large lumps of iron, which are sustained at one

A Smith.

end by the anvils and at the other by iron chains fastened to the ceiling of the forge. This last method is employed in the largest works, such as the making of anchors of ships, which weigh several thousand pounds.

In lighter works, such as we have in the plate—namely, in the making of Stoves, Shovels, Gridirons, Trivets, &c., a single man is sufficient to hold, to heat and to turn the iron with one hand, while he strikes it with the other.

The several heats given by smiths to their iron are called the bloodred heat, the white heat and the welding heat.

The bloodred heat is used when the iron has already acquired its form and size, but wants hammering only to smooth and fit it for the file.

The white heat is used when the iron has not its form and size, but must be forged into both.

The welding heat is required when two pieces of iron are to be united end to end.

The uppermost surface of the anvil on which a smith hammers his iron must be very flat and smooth and so hard that no file will touch it. At one end of the anvil is a hold, in which may be placed a strong steel chisel or spike; on this a piece of red hot iron may be laid and cut in two with a single stroke of the hammer. Anvils are sometimes made of cast iron, but the best are those which are forged with the upper part made of steel. The whole is usually mounted on a firm wooden block.

The vise fixed to the bench serves to hold anything upon which the smith is at work, whether it requires filing or bending or riveting. There are hand vises and small anvils which are occasionally used in the more delicate operations of this business.

Square and flat bars of iron are sometimes twisted for ornamental work; this is done by giving the metal a white heat, fixing it in the vise and turning it with the tongs.

Iron rails before houses are generally made of cast iron, which is run from the ore, and neither requires nor will bear the hammer. It is brittle and will not yield in the least to the file. It is the business of the blacksmith to make the upper rail to receive these bars and to fix them into the stonework.

It would be impossible to enumerate all the articles manufactured by the smith; they are of all kinds and of almost all values. I have seen a steel stove made at Brodie's manufactory in Carey street of several hundred pounds value, and a more interesting sight cannot well be viewed than the storerooms of our large furnishing ironmongers.

Iron is dug out of the bowels of the earth in many parts of this kingdom, but great quantities are imported from Sweden and North America in pigs and bars.

Blacksmiths charge for hammered work, such as Rails, Window Bars, &c., sixpence per lb.; for ornamental work, as Brackets, Lamp Irons, &c., from eightpence to fourteen pence per lb., and Cast Iron Rails, Sash Weights, &c., about fifteen or eighteen shillings per hundredweight.

A journeyman smith will earn from three to five shillings per day, but those who work on the fine polished articles will earn much higher wages.

A SHIPMENT of Whips notable for its size was recently received by the Norvell-Shapleigh Hardware Company, St. Louis. The entire consignment consisted of 4500 dozen, which was somewhat in excess of a single car's capacity, and in consequence the surplus was forwarded by local freight. The fact that it was found, upon application for freight rate applying to this shipment, that no carload rate was given in the classification, is significant of the infrequency of orders of this size. The entire assortment of this order included only four kinds of Whips—Phila-bone, Raw-bone, Black Prince and Armor Clad.

BLACK & Co. have disposed of their Hardware and Agricultural Implement business at Andover, Ohio, to Ward & Kingsley, who will continue at the old stand.

THE PADUCAH HARDWARE & IRON COMPANY has been succeeded by the Paducah Iron Company, 124-126 South Third street, Paducah, Ky., recently incorporated, with a capital of $10,000. The new company will deal in Iron, Steel and Heavy Hardware, Carriage and Wagon Wood Stock, Blacksmiths' Tools and Supplies. The incorporators are Fred. Speck, Walter McDowell and J. W. Speck.

MISCELLANEOUS NOTES.

Champion Lock Joint Metal Shingles.

The Eller Mfg. Company, Canton, Ohio, is manufacturing its Champion metallic shingles with a new lock joint, which has been patented. The company recommends that its special ridge and hip roll and capping, also its special valley be used with these shingles, to guarantee them against leaks.

Dog Collar Padlocks Display Card.

The Tower & Lyon Company, 95 Chambers street, New York, is sending out assortments of dog collar padlocks, neatly displayed on a new card holding 12 padlocks and keys. The card for counter or window display is 8½ x 10½ in., printed in several colors, the head of a dog covering a large portion of the card.

Bottle for Hot or Cold Liquids.

The Lorenz Mfg. Company, 35-37 Frankfort street, New York, is manufacturing the Dr. Kidd hot milk pocket, for keeping hot liquids hot and cold liquids cold for a period of about 8 hours, by means of an insulated metallic device. While intended largely for keeping milk warm for infants' use, it is equally serviceable for maintaining the temperature of coffee, tea, chocolate, lemonade, broths, soups, or any preparation that can be poured readily, either hot or cold. It consists of a decorated enameled tin can with screw top, 3 in. diameter and 8 in. high. Inside of the cylinder there is a composition and next to that a circle of thick felt, into which is slipped an 8-oz. glass bottle, 2 in. in diameter, with ounce graduations on the side. The screw top is lined with thick felt on the inner side to complete the insulation. This device is very moderately priced, in comparison with the more expensive metal devices for such purposes, now on the market.

The National Carbon Paint Company.

The National Carbon Paint Company, successor to the Natural Carbon By-Products Company, Freeport, Ill., has recently put on the market a line of dry and mixed Paint under the name of Mindura. It is stated that the carboniferous metallic mineral which constitutes the body of the Paint is, after being washed and heated in retorts, reduced to a fine powder, which is incorporated in a binder of linseed oil. The mineral is represented as having a low specific gravity, which, together with the fineness to which it is ground, enables it to hold well in suspension and prevents rapid settling. It is recommended as especially servicable for the protection of iron and steel, in bridgework, roofing and other structures. The officers of the company are: Charles L. Kiewert, president; M. Schauer, vice-president, and F. W. Siecke, secretary and treasurer.

Wilcox Wonder Mounted Grindstone.

The mounted grindstone shown in the accompanying illustration is manufactured by the Wilcox Mfg. Company, Aurora, Ill. The frame is constructed throughout of steel, the principal supports of which are made of steel angles. A steel axle mounted on roller bearings supports the wheel, which is driven by a flexible steel cable attached at either end to the treadles. A continuous application of power is effected through floating or friction clutches in pulleys on either side of the wheel, over which the cable passes as it is drawn back and forth by the treadles. Since, by the use of this mechanism, there are no dead centers to retard the motion, it is claimed that besides producing an even, steady movement, a sav-

ing in the power required to turn the stone is realized. The wearing parts of the frame gear are protected from dust and grit and a steel strip in front of the wheel guards the operator from the drippings. By removal of bolts in the uprights beneath the seat and from side braces the frame can be conveniently folded for crating.

Wilcox Wonder Mounted Grindstone.

Raised points chiseled on the angle foot pieces of the frame serve to guard it against slipping. The frame and stone crated complete has a shipping weight of 80 lb.

Crown and Crescent Surface Hinge.

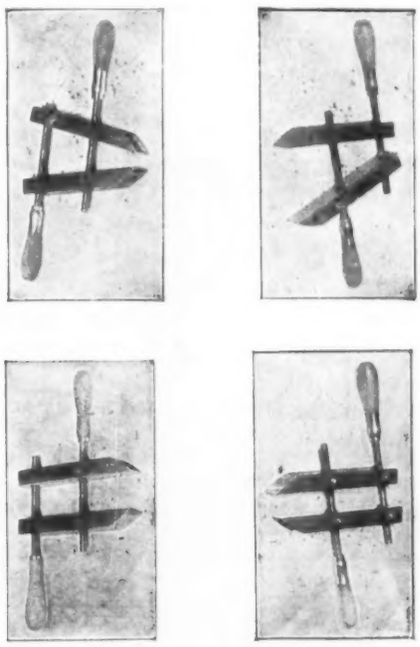
Accompanying this article is a full size reproduction of the Crown and Crescent surface hinge, which is an

Crown and Crescent Surface Hinge.

addition to the line of McKinney Mfg. Company, Pittsburgh. It is made of wrought steel and is electro-plated in any desired finish. The design is neat and the workmanship and finish are said to be of the best. The hinge is intended for use on window seats, cupboards, china closets and in various other interior places where an attractive piece of hardware is desired.

The Thompson Patent Clamps.

The Erie Stamping & Mfg. Company, Erie Pa., is making the clamps shown in the accompanying illustrations. The device is made entirely of metal, with the exception of the handle, which is wood. The jaws are in the form of a channel and are made of the best steel, as are also the spindles and swivels, making them strong and comparatively light. As seen in the illustrations, the jaws can be adjusted to various angles and can be made to overlap. The jaws are polished, so as not to mar the

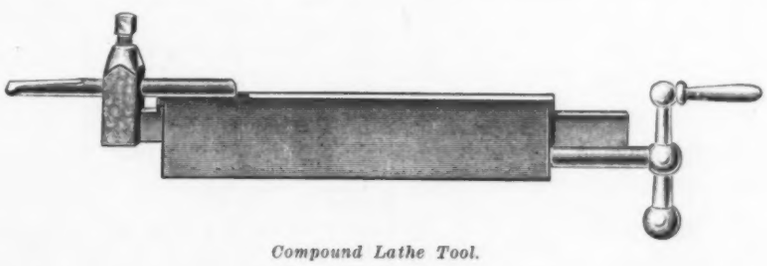


The Thompson Patent Clamp.

finest surface and so that glue will not adhere to them or the spindles. The clamps are furnished plain or nickel plated and are made in five sizes, to open 5, 7, 9, 12 and 14 in.

Compound Lathe Tool.

The accompanying illustration represents a compound lathe tool manufactured by the Dosch Mfg. Company, Bridgeport, Conn. It is made of steel, highly polished, and the screw runs in a bronze nut. It has a 2-in. throw and may conveniently be carried in a tool box, as it is so small and compact that it takes up no more room than a common boring tool. It fits the tool post like any ordinary tool. It will bore all kinds of taper holes, and can also be used to bore straight holes. A piece of 9-32 in. drill rod will fit in the holder, and the rod can be ground down to any smaller size desired. The tool can be used to turn off lathe centers, screw machine bushings, taper bushings of all kinds, or for boring tapers on blanking dies. It has the advantage of getting at all tapers, whether slight or abrupt. For pattern makers it is adapted to boring and counterboring core boxes or boring on taper. By installing this tool



Compound Lathe Tool.

the makers state that large shops can economically equip every lathe to do the work usually reserved for a lathe with an expensive compound attachment. The tool is furnished with a wrench and drill, and is sold with an unreserved guarantee at the price of $5.

Lehigh Washing Machine.

L. H. Yeager & Co., Allentown, Pa., are manufacturing the Lehigh ball bearing lever washing machine, here illustrated. Fig. 1 shows the machine complete with triangular stand, having three-piece mitered top, Figs. 2 and 3 indicating better some of the structural details. The tub is made of white Virginia cedar, including top and bottom, the six 6-in. fluted ash wooden pegs for agitating the clothes having 10 longitudinal flutes, or 60 in all, the flutes causing a suction of a helpful character in washing. The pegs are securely fastened to the top by three 3½-in. screws in each peg. The double cedar lid provides a step joint which, it is said, makes the machine practically steam tight. The tub is bound with round electric welded iron hoops recessed in grooves. The inner side of the tub is fully corrugated, like a washboard. The detachable stand, which can be used for other purposes as well, will safely sustain 500 lb. In washing, the power is applied direct through a single lever and shaft. The two bearings contain 24 hardened steel balls, ⅜-in. diameter, rotating in milled ball races, which afford about 10½ sq. in. of wearing surface. The iron castings and working parts are galvanized and machined for easy operation. The entire top can be instantly lifted clear of the tub by means of a spring actuated hinge, having a ½-in. round iron rod with trunnions at each end. By a pull on a short length of safety chain attached to each movable part the bolts are withdrawn, so that the top can be lifted clear. An automatic catch keeps the cover tight. Brass thumb screws are used and there is a plug for drawing off the water, as occasion requires.

Fig. 1.—Lehigh Washing Machine and Stand.

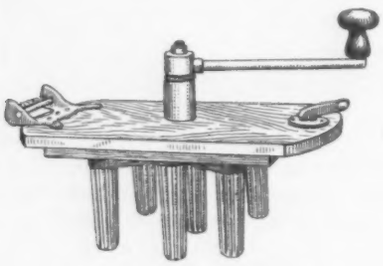


Fig. 2.—Agitator Detached.

Fig. 3.—Wash Tub with Top Removed.

The Hallettsville Hardware Company, Hallettsville, Texas, has lately incorporated with a capital stock of $25,000. The company handles Shelf and Heavy Hardware, Tinware, Farm Implements, Paints and Sporting Goods, at wholesale and retail.

The Russell Porter Hardware Company, West Allis, Wis., is erecting a new building on National avenue. The company has added hot water and steam heating, plumbing and electrical work to its former lines.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal
Linseed, City, raw	43 @44
City, Boiled	44 @45
State and Western, raw	40 @41
Raw, Calcutta, in bbls	70 @..
Lard, Extra Prime, Winter	75 @77
Extra No. 1	53 @55
No. 1	49 @52
Cotton-seed, Crude, f.o.b. mills	@..
Summer Yellow, Prime	@56½
Summer White	@59
Yellow Winter	@59
Sperm, Crude	59 @60
Natural Winter	72 @73
Bleached Winter	75 @76
Bleached Winter, Extra	@..
Tallow, Prime	61 @63
Whale, Crude	35 @36
Natural Winter	48 @49
Bleached Winter	50 @51
Extra Bleached Winter	52 @53
Menhaden, Brown, Strained	35 @36
Light Strained	35 @36
Northern	@..
Southern	@..
Cocoanut, Ceylon ℔ lb	8¾@ 9
Cochin ℔ lb	10 @10¾
Cod, Domestic, Prime	36 @38
Newfoundland	40 @42
Red, Elaine	47 @50
Saponified ℔ lb	7 @ 7¼
Olive, Italian, bbls, Yellow	70 @75
Neatsfoot, Prime	56 @67
Palm, Logos ℔ lb	6¾@ 7

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	12½@13
29 gravity, 15 cold test	13 @13½
Summer	12 @12½
Cylinder, light filtered	19 @20
Dark, filtered	16½@17½
Paraffine, 903-907 gravity	14 @14½
903 gravity	13 @13½
883 gravity	10¾@11¼
Red	13 @13½

Miscellaneous—

Barytes:		
White, Foreign ℔ ton	$18.50	@20.50
Amer, floated ℔ ton	19.00	@20.00
Off color ℔ ton	13.00	@16.50
Chalk, in bulk ℔ ton	3.00	@ 3.25
In bbls ℔ 100 lb	..	@ .35
China Clay, Imported ℔ ton	11.00	@17.50
Cobalt, Oxide ℔ 100 lb	2.50	@ 2.60
Whiting, Commercial ℔ 100 lb	.43	@ .52
Gilders ℔ 100 lb	.55	@ .65
Ex. Gilders ℔ 100 lb	.60	@ .65

Putty, Commercial—℔ 100 lb

In bladders	$1.70	@1.85
In bbls. or tubs	1.20	@1.45
In 1 lb to 5 lb cans	2.65	@2.95
In 12½ to 50 lb cans	1.50	@1.90

Spirits Turpentine—℔ gal.

In Oil bbls	57½@58
In machine bbls	58 @58½

Glue—

	℔ lb
Cabinet	12 @15
Common Bone	7½@ 9
Extra White	18 @24
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—℔ lb

Bleached, Commercial	40 @42
Bone Dry	48 @50
Button	40 @50
Diamond I	58 @59
Fine Orange	48 @52
A. C. Garnet	45 @46
G. A. L	39 @40
Kala Button	32 @33
D. C	62 @63
Octagon B	56 @57
T. N	40 @42
V. S. O	58 @59

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	14 @14
Green, Chrome	12 @16
Green, Paris	@21
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	10½@10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 7½
Lots less than 500 lb, in Oil	@ 8
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½
Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
Zinc, American, dry	5⅝@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¾
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	11
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	13¼@13¾
Lots of less than 1 ton	13⅝@13⅞
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@12¾
Lots of less than 1 ton	12⅛@12⅝

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	6¼@10
Black Drop, American	3½@ 8
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	30 @33
Blue, Prussian	28 @32
Blue, Ultramarine	3½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs	@ 7¾
Litharge, bbls., ½ bls., kegs	@ 7¾
Ocher, American ℔ ton	$8.50@16.00
American Golden	2½@ 3¼
French	1¾@ 2
Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
French	11¾@12
German	10 @12
American	8¾@ 9
Red, Indian, English	4½@ 6
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer. ℔ 100 lb	$0.50@1.25
English ℔ 100 lb	$1.15@1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw, Powdered	3 @ 7
American, Raw	1½@ 2
American Burnt and Pow'd.	1½@ 2
Talc, French ℔ ton	$18.00@25.00
American ℔ ton	15.00@25.00
Terra Alba, French ℔ 100 lb	.90@ 1.00
English ℔ 100 lb	.80@ 1.00
American ℔ 100 lb, No. 1	.75@ .80
American ℔ 100 lb, No. 2	.60@ .65
Umber, Turkey Brt. & Pow.	2 @ 3¼
Turkey, Raw and Powdered	2¼@ 3½
Burnt, American	1¼@ 2
Raw, American	1½@ 2
Yellow Chrome, Pure	12 @14
Vermilion, American Lead	7 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	@66
English, Imported	.65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
Norris 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....₱ lb @8½¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—

Peter Wright & Sons, ₱ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@80%
Jennings' Pats., reg. finish.... 60&5@60&10%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....70%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ₱ doz. $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@3.4¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—See *Grease, Axle*

Axles—*Iron or Steel*

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose....3¾@4¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12.....60@65%
Nos. 13 to 14.....60@65%
Nos. 15 to 18.....65&70%
Nos. 19 to 22.....65@70%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel—

No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. 4, Jap'd, $1.15; No. 8, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

	6	7	8	9	10
Inch..					
Doz..	$5.00	5.50	6.00	6.50	7.50

Molders—

	10	12	14	16
Inch..				
Doz..	$7.50	9.00	12.00	15.00

Net Prices.

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....50@50&10%
White Metal.....50@50&5%
Nickel Plated.....50%
Swiss 50%
Cone's Globe Hand Bells.....33⅓@50%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....40&5%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Laue's Patent Automatic Lock and Junior 50%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%
Embossed 50%

Boards, Wash—See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ × 6 and smaller...70&5@...%
Larger and Longer..60&2½@...%
Phila. Eagle $3.00 list May 24, '99 80%
Bolt Ends.....65@65&5%
Machine (cut thread): ⅜ × 4 and smaller..70&7½@...%
Larger and longer..60&7½@...%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch	3	4	5	6	8
Per doz.	$3.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz.	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.85

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....5&10%

Plow and Stove—

Plow .....65&5@...%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84 .....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz.	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz.	$5.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 15%

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.

	Quart.	10	12	14	
Water, Reg.		25.35	28.00	32.00	10&5%
Water, Heu.		45.35	48.00	52.00	
Fire, Rd. Btm.		32.00	34.65	38.65	
Well		37.35	41.35	45.35	

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26, '06. 45@45&10%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—*Discount*

Reversible and Broad.....70&5%
Light Reversible, Light Narrow .....70&5%
Loose Joint, Narrow, Light Inside Blind, etc.....70%
Back Flaps, Table Chest....65%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 .....30%

Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled.....35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt, 4(@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4(@4¾¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing.....35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem.....20%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

5-16	¼	5-16	⅜	7-16	½	9-16
$8.77	6.17	5.02	4.57	4.37	4.27	4.22
⅝	¾	⅞ to 1	1⅛ to 1¼ inch.			
4.17	4.07	4.02	4.12			

In cask lots, deduct 25¢.
German Coil.....60&10&10@70%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co, Halter.....35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring.$28.00
6½—6-2, Straight, with ring.$29.00
6½—8-2, Straight, with ring.$32.00
6½—10-2, Str'ght, with ring.$37.00

NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c.....60%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....50&10%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....lb.4½@4¾%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
American Halter, Dog and Kennel Chains.....35&2½@40%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 45@50¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's.....45%
Pullman, per gro.....$54.00
Russwin.....33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....25%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools.....25%
Machinists' and Pipe Fitters' Chests, Empty.....45%
Tool Cabinets.....45%
C. E. Jennings & Co.'s Machinists' Tool Chests.....7½%

Chisels—

Socket Framing and Firmer

Standard List.....70&10@75%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's.....66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold— *lb.*

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....20%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 83 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318..35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 56.....35%
Steel Face Plate Jaws, Nos. 70 and 72.....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....50&10%
Resiy, Parallel.....33⅓&10%
Myers' Hay Rack.....45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..95.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80&30&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....60&10@70%
Compression Bibbs...55&10@60%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....70&10%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	70%	50&17½%	30&10%
Central:			
	70&5%	60%	30&10%
Western and Southern:			
	70%	55&5%	30&7½%
So. Western			
	65&5%	50&5%	30&5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles,					
Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled.....10%
Agate Lined.....10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 30@33¢; lighter than 3 lb. to pair.....32@35¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 26¢; No. 7, 26½¢; No. 6, 27½¢.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....lb...20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted..lb.13@14¢
Patent India, Twisted...lb...17¢
Pearl Braided, cotton, No. 6, ℔ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord.....18%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....℔ lb 40¢
Massachusetts, Drab....℔ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢; 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 33¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co, Wire Picture Cord.....85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber.....℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Giant Lumber, 5¾ in. x 15-16 in. round, all colors, $16.25; Indelibles.....$18.75
Genuine Soapstone, Metal Workers', 5 in. x ⅝ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light.....$5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....60%
B. Mfg. Co.....40%
Woodward.....50%

Meat and Food—

American.....30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

No. 202, $1.50.....25@25&7½%
No. 202, $1.50.....40&7½%
P., S. & W. Co.:
Dixon's.....℔ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Hales.....60&10&5%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ℔ doz. $24.00, 40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
$15.00 $18.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz.....$8.75
Split Handle Post Hole Diggers, ℔ doz., $7.75
Hercules Pattern, ℔ doz.....$10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 612.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W.: 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*	
Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:		
70&30%	70%	30&10%
Central:		
80%	70&5%	30&10%
Western and Southern:		
70&30%	70%	30&7½%
So. Western:		
75&7½%	65&5%	30&5%

Terms.—2% for cash. Factory shipments generally delivered.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Standard Gauge.....80%
No. 26.....50%
No. 24.....25%
No. 22.....10%
Copper.....40&10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	¼ to 46:	5½ to 220:	Flour.
Kegs.....lb.	5 ¢	5½¢	5½¢
½ Kegs.....lb.	5½¢	5¾¢	5¾¢
¼ Kegs.....lb.	5½¢	6 ¢	6 ¢
10 lb. cans, 10 in case....	6½¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 5 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Upson's .....40&10%
Upson's Patent.....40%

Cord and Weight—
Ives and Titan.....33⅓%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Branch.....75&10@80%
Lower Grade.....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....35 1-3@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....66⅔%
Champion, Hay.....66⅔%
Champion, Header.....66⅔%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....60&20%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} *Extra 10&2½%*

Gates, Molasses and Oil—
Stebbins' Pattern.....75@80%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&5@60&10%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@60&10&5%

Hammers—Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' .....40&10&5%
Riveting 50%
Machinists', revised list.....66⅔&5%
Blacksmiths' .....50&5%
Fayette R. Plumb:
A, E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢..80@80&5%
3 to 5 lb., per lb., 40¢..80@80&5%
Over 5 lb., per lb., 30¢....80&10@80&10&5%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory....$1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Hatchet Auger Handles .....15&20%
Nicholson Simplicity File Handle.....₱ gro. $0.85@$1.50
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 30 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.
} *50%*

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 122 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
} *Extra 5&10% often given.*

Hangers— Garment—
Pullman Trouser, ₱ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....₱ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₱ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—
Regular list, first qual..40&7½%—
Second quality.....50&10%—

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.80; No. 3E, $3.25; No. 1, $3.50.....25%
Clark Coal, ₱ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 00, 0, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....70&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.85*

New England:
With Latch.....doz. ....@$2.00
Without Latch...doz. ....@$1.60
Reversible Self-Closing:
With Latch.....doz. ....@$1.75
Without Latch...doz. ....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.: Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot, Steel Hold Back, ₱ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House.....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₱ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ₱ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ₱ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
} *Extra 10% often given on most of these Hinges.*

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap...60&5%
Cor. Ex. Heavy T...50&10%
} *Extra 10&7½%*

Screw Hook and Strap.
6 to 12 in...lb. 3½¢
14 to 20 in...lb. 3½¢
22 to 36 in...lb. 3½¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*13*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*33*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*3*	*36*	*39*	*43*

} *20&10%*

Hones' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 23, 1899.....40&10@75&10%

D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5%
Mining Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Weeding.....₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz. pairs. $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks..70&10@75%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz.....$1.75
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Coven Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10%
Bench Hooks—See Beach Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—

From 4 to 10.....*lb. 3 @3½¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..*lb. 3¾@4¢*

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....*doz. 40¢*

Irons, Soldering

See *Copp.ers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 150...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Wilmington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz.$5.50@5.75
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....45%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....*doz. $4.35@4.50*
Side Lift, No. 0.....*doz. $4.60@4.75*
Hinge Globe, No. 0..*doz. $4.60@4.75*
Other Styles.....*40@40&10%*

Bull's Eye Police—

3-inch.....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..*doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet.....	*$2.50*	*2.25*	*2.00*
75 feet.....	*$1.75*	*1.35*	*1.10*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers......*$2.00@2.25*
Com. Angl'r, without Augers,.....*$2.25@2.50*
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power....₱ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1.$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—

Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors Water—

Divine's Red Devil.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70&10%
Style B, Low Wheel.....70&5%
Style C, High Wheel, spcl. disct., 70&10%
Style D, High Wheel, spcl. disct.70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style B, High Wheel.....60&10&5%
Drexel and Gold Coin, special list.40%
Horse.....40&5%
Pony.....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous.....*87½@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	.....net
New Haven..	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	.....10%

Western.....₱ lb 8½¢
Jobbers' Special Brands.....*per lb.9@10¢*

Picture—

	1½	*2*	*2½*	*3*	*in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*1.10*	*1.10*	*1.10*	*..*	*gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Square, Blank or Tapped..*4.80¢*
Hexagon, Blank or Tapped..*5.10¢*
Square, Bl'k, C., T. & R...*5.10¢*
Hexagon, Bl'k, C., T. & R..*5.70¢*
Hot Pressed:
Square, Blank.....*5.00¢*
Hexagon, Blank.....*5.40¢*
Square, Tapped.....*4.70¢*
Hexagon, Tapped.....*5.10¢*

Oakum—

Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*5¾¢*
In carload lots ⅛¢ lb off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5@70%*
Zinc.....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*55@60¢*
Sardine Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....*20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb, 80¢.....25%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&7½@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
*Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.*3½to5¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft......*6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in......*3@5¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll.....*40@50¢*
Medium weight, 30 lbs. to roll..*50@55¢*
Heavy weight, 40 lbs. to roll..*65@70¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$50.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.....*$34.00@$38.00*
2 ply, roll 108 sq. ft.....*68¢*
3 ply, roll 108 sq. ft.....*98¢*
Slater's Felt (roll 500 sq. ft.)..*75¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth.....*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Livingston Nail Co.:
Daisy.....₱ doz. $1.00
Little Star.....₱ doz. $5.00
Rocking Table.....₱ doz. $6.20
Reading Hardware Co.:
Advance.....₱ doz. $4.00
Baldwin.....₱ doz. $4.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25

Potato—

Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899..*70&5@70&10%*
Cronk's Handled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....50%
Extra Heavy, 2-6 in.....60%
Fittings, Stand. and H'vy...70%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	64	48	57	41
⅜ in.....	66	52	59	41
½ in.....	68	56	61	49
¾ to 6 in....	72	62	66	56
7 to 12 in....	69	54	61	46

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 82%
Second-class 85%
NOTE.—Market irregular.

Pipe, Stove—

Edwards' Nested:	Per 100 joints. C. L.	L. C. L.
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$6.15	$7.15
6 in., Uniform Color	6.65	7.65
7 in., Uniform Color	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Unica 60%

Iron Planes
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....₩ doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers
Button Pliers.....75@75&10%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....80&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....80%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....33⅓%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers.....lb. 9¢
¼-lb. papers.....lb. 10½¢
¼-lb. papers.....lb. 11 ¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (½ pt.), ₩ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50; ½ lb boxes, ₩ doz. $1.25; 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25.
Barkeepers' Friend Metal Polish, ₩ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ₩ gr. $5.75.....10%
Dixon's Plumbago.....₩ lb 8¢
Fireside .....₩ gr. $2.50
Gem, ₩ gr. $4.50.....10%
Japanese .....₩ gr. $3.50
Jet Black.....₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₩ doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.88; gro.$8.75
1 qt. Round..doz.$1.00; gro.$10.00
1½ qt. Square.doz.$1.10; gro.$11.00
2 qt. Square..doz.$1.35; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Presses—

Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ₩ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₩ doz., $12.00... 33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B (large).....$5.80
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate per doz., 1¾ and 2 in....20@21¢
Acme. No. 35..1¾ in., 19¢; 2 in., 20½¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₩ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26 Tron..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c....50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....75&5%
Contractors' Rubber Diaphragm No. 2 R. & L. Block Co.....$16.00
Daisy Spray Pump.....₩ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher. .....75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....45%
Myers' Power Pumps.....45%
Myers' Spray Pumps.....45%

Pump Leathers—
Lower Valve Leathers—Per gro.:

Inch....	2	2½	3	3½	4
	$3.10	3.70	4.35	4.95	5.60

Crimped Plunger Leathers—Per 100:

Inch.....	2½	3	3½	4
	$4.15	5.25	7.80	9.65

Punches—
Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.60
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ₩ doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ₩ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₩ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₩ 100 ft. $3.45
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....₩ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₩ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, ₩ ft., 11¢, 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₩ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, ₩ doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, ₩ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ₩ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....₩ doz. $3.15
Lawn Queen, 24-tooth....₩ doz. $3.25
Paragon, 20-tooth.....₩ doz. $2.70
Paragon, 24-tooth.....₩ doz. $2.75
Steel Garden, 14-tooth....₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic.....60%
Fox Razors, ₩ doz., No. 42, $28.00; No. 44, $20.00; No. 82, Platina, $25.00. } In case of 6
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9½, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 96 PN.....20%
2904 P, 33¼%; 2904 PN, 33¼%; 0924 N, 33¼%; 02004 N, 33⅓%; 002904 PN, 33¼%; 902 N, 33¼%.....25%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 66⅔%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal, 40&10%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.30	1.50	1.90 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes....$4.25
*Hill's Ringers, Gray Iron, doz.*60¢
Hill's Ringers, Malleable Iron ... doz.80¢
Blair's Rings.....per gro.
Blair's Ringers.....per doz.75¢
Brown's Rings.....per gro.$5.25
Brown's Ringers....per doz.75¢

Rivets and Burrs—
Copper .....33⅓@35%
Carriage, Coopers', Tinners, &c.:
Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Anti-Friction, No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb., 13@13½¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 9¼¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 7¾@8¢
Pure .....lb., 9¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....lb., 7¼@7½¢
Pure .....lb., 8¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb..9¢
Thread, No. 2, ¼-in. & up, lb..8½¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination.....5%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood .....30@30%
Folding, Steel.....33⅓&10%
Lufkin's Steel .....50&10%
Lufkin's Lumber.....50&10%
Union Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¼ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, S 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Buccher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 50%
Hack Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co. 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Grimm's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 60%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain. $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Twin Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.50@2.60
Ship ..... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... 75&15%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&10%
Hand Rail, list Jan. 1, '81 ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron, Brass or Bronze ..... 50@50&10%
Fillister Head, Iron, Brass or Bronze ..... 40@40&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@..%
Round Head, Iron ..... 85&5@..%
Flat Head, Brass ..... 80&5@..%
Round Head, Brass ..... 77½&5@..%
Flat Head, Bronze ..... 75&5@..%
Round Head, Bronze ..... 72½&5@..%
Drive Screws ..... 87½&5@..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— Per doz.

Grass, No. 1, Plain ..... $6.25@6.75
Clipper, Bronzed Webb. $6.50@7.00
No. 3 Clipper, Pol'd Webb. $6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2. $6.50@7.00
Grain, No. 1 ..... $8.25@8.75
Bronzed Webb, No. 1 .. $8.50@9.00
Nos. 3 and 4 Clipper, Grain .. $8.75@9.25
Solid Steel, No. 6 ..... $9.25@9.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 .. 20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ₱ gro, $12 .. 40&10%
Mayhew's ..... ₱ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled Cup Pt. ..... ₱ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... ₱ doz. $8.00
Royal, Hand ..... ₱ doz. $4.50
Taintor Positive ..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ₱ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz $1.50
Mounted Kitchen Sand Stone, ₱ doz $1.50
Natural Grit Carving Knife Hones, ₱ doz $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz $1.50
Quick Edge Pocket Knife Hones, ₱ doz $2.00
} 50%

Skate—

Smith & Hemenway Co., Eureka .. 50%

Shaves, Spoke—

Iron ..... doz. $1.10@1.25
Wood ..... doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ₱ doz. $9.00 ..... 15&10%

Shears—

Cast Iron	7	8	9 in.	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality, Nickel .. 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. ..... 40&10%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ₱ doz., $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand. 60&10%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 65&10%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union, League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade .. 20%
Expert, 10, 12, 16 and 20 gauge, 33⅓&5%

Shells, Loaded—

Loaded with Black Powder .. 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders. 40&5%
Arrow, Smokeless Powders. 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.25	$5.50
Dixie, 10 x 14 in.	4.50	6.00
Dixie, 7 x 10 in.	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₱ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.90
Drop, B and larger 2.15
Buck 2.15
Chilled 2.15
Dust 2.40

Shovels and Spades—

Association List, Nov. 15, 1902. 40%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mall. D. Handle. $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00
Hunter's Genuine ..... per gro. $12.00@12.50

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 40 to 24 x 50 in 50%
24 x 60 to 24 x 120 in 30%
Barnes' low list:
Up to and including 20 x 36 in 50%
20 x 40 to 24 x 50 in 45%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless. 60&5 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. ..... ₱ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider:	*Per 100 lb.*
Black	*$4.75@$5.00*
Half Bright	*$4.75@$5.00*
Bright	*$5.25@$5.50*

Painted Seat Springs:
1½ x 2 x 26 ..... per pr. 47@49¢
1½ x 3 x 28 ..... per pr. 69@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₱ doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. } List Jan. 5, 1900.
Steel and Iron. } 75&10%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... lb. 6@6½¢
Electricians', Association list .. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples ..... per lb. 3½@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— ..... 50@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock .. 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₱ lb
Arkansas St. No. 1, 3 to 5½ in. .. 2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. .. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
} 33⅓%
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks. 40%
Hindostan No. 1, R'g'lar, ₱ lb 8¢
Hindostan No. 1, Small, ₱ lb 10¢
Axe Stones (all kinds) 25%
Turkey Oil Stones, Extra, 5 to 8 in. ..... ₱ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢
} 25%

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₱ gro. $12.00
Lamoille S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $9.00
Green Mountain S. S., ₱ gro. $6.00
Extra Indian Pond S. S., ₱ gro. $7.50
No. 1 Indian Pond S. S., ₱ gro. $7.00
No. 2 Indian Pond S. S., ₱ gro. $4.50
Leader Red End S. S., ₱ gro. $4.50
Quick Cut Emery, ₱ gro. $10.00
Pure Corundum, ₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
Electro (Artificial), ₱ gro. $12.00 33⅓%
Lightning (Artificial), ₱ gro. $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers, ₱ gro. $9.00

Stops—Bench—

Millers Falls 15&10%
Morrill's, ₱ doz., No. 1, $10.00 60%
Morrill's, No. 2, $12.50 60%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stephens Co. 20%

Straps—Box—

Cary's Universal, case lots 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points, dos. 60@60&10%
Socket dos. $1.00
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ₱ doz.
Superba, Crotch Mahogany $36.00
Triumph, Fancy Veneers $33.00
Parlor Queen, Fig. Rosewood $30.00
Elite, Hungarian Ash $29.00
Am. Queen, Fig. Mahogany $27.00
Ideal, Bird's-Eye Maple $25.00
Grand Rapids, Nickel, $24.00; Japan $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top $36.00
Grand, 17 in. wide $36.00
Club, 24 in. wide $54.00
Hall, 28 in. wide $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks 90&25%
American Cut Tacks 90&25%
Swedes' Cut Tacks 90&25%
Swedes' Upholsterers' 90&35%
Gimp Tacks 90&35%
Lace Tacks 90&35%
Trimmers' Tacks 90&25%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks, 90&10%
Hungarian Nails 80&10%
Finishing Nails 70%
Trunk and Clout Nails 80%

NOTE.—The above prices are for Standard Weights.

Miscellaneous—

Double Pointed Tacks 90&5 or 5 tens
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$5.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin 50@—%
Patent Leather 25@30&5%
Steel $3 1-3&5%
Chesterman's 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop 80&10&5%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools 35&5%
Simonds' Improved 33⅓%
Simonds' Crescent 33⅓%

Ship—

L. & I. J. White 35%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 70&10%
Newhouse 45@45&5%
Hawley & Norton 65%
Victor 70&10%
Oneida Community Jump 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25; case of 24 $11.50 doz.
No. 3, Rat, ₱ doz., $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 $4.70 doz.
No. 4, Mouse, ₱ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 $2.25 doz.

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston " Standard Brand " and Garden Trowels 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, ₱ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ₱ doz. $16.00
Grocery ₱ doz. $15.00
McKinney Trucks, each, net $10.00
Model Stove Trucks, ₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	$67	$79	$89	$99

10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 23@23¢
No. 12, ¼ and ½-lb. Balls 21@22¢
No. 18, ¼ and ½-lb. Balls 18@20¢
No. 24, ¼ and ½-lb. Balls 17@19¢
No. 36, ¼ and ½-lb. Balls 16@18¢
Chalk Line, Cotton ½-lb. Balls 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 26 Mattress, ¼ and ½-lb. Balls, according to quality, 30@60¢
Wool, 3 to 6 ply... B 9¢; A 10¢

Vises—

Solid Box 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel 25%
Star, Solid Jaw 40%
Hollands':
Machinists' 40@40&5%
Keystone 65&10&10%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip 15%
Merrill's 20%
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Rock Island 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, ₱ doz. $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up 60¢
B. E., 9 and 10 70¢
B. E., 8 80¢
B. E., 7 80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 45&10%
Ground 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles 65&10%
Covered Wares:
Tinned and Turned 35&10%
Enameled 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
Iron Clad Ware 70&10%
Lava and Volcanic, Enameled 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&5@50&10%
Never Break Spiders and Griddles 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.55
Cable Cross, family size, stationary protector $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.95

Washers—Leather, Axle—

Solid 80&10@90%
Patent 90@90&5%
Coil: ⅞ 1 1¼ 1¼ *Inch.*
10½¢ 11½¢ 12½¢ 16¢ *per box*

Iron or Steel—

Size bolt... 5-16 ⅜ ½ ⅝ ¾
Washers... $5.90 5.00 3.70 3.50 3.30
The above prices are based on $5.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots... per lb. 1¾@2¢

Wedges—

Oil Finish... lb., ...@3¢

Weights—Hitching—

Covert Mfg. Co. 30&2%

Sash—

Per ton, f.o.b. factory:
Eastern District $30.00
Southern Territory $24.00@25.00
Western and Central Districts $25.00@28.50

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 72&10&7½%
10 to 18 72½&10&10%
19 to 26 75&10&10&2½%
27 to 36 77½&7½%
Galvanized:
6 to 9 72½&10%
10 to 14 72½&10&5%
15 to 16 72½&10&5%
17 to 18 72½%
19 to 26 70&5&2½%
27 to 36 65&10&10%
Copper:
6 to 9 65&10&10%
10 to 14 70&10&5%
15 to 18 65&10&10&10%
19 to 26 70&5&2½%
27 to 36 72½&10&2½%
Tinned:
6 to 18 67&10&10%
Brass 2¼ *lb., base*
Copper 32¢ *lb., base*
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned, 65&10@70&5%
Brass and Copper 45@50&10%
Retailers' Assortments, per box, 2.50@$8.50
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods 90&15%
Brass Wire Goods 90%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Wire Netting 80&5%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ & 3 Mesh $3.40
Nos. 4 and 5 Mesh $3.65
No. 6 Mesh $3.90
No. 8 Mesh $4.40

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75@75&10%
Alligator or Crocodile 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 45@45&5%
Acme 60&10%
Alligator Pattern, 70%; Bull Dog 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50%
Combination Black 40&5%
Merrick Pattern 50%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model 40&10&5&5%
Coes', Genuine Hammer Handle 40&10&5&5%
Coes' " Mechanics' " 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 70%
Gem Pocket 50%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases 50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Railroad Special, Iron Handle, 40&10&5%
Other Wrenches 50%
Vulcan Chain 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 90%

Zinc—

Sheet... per 100 lb., $8.00@$8.25

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1¾ in. round and square	₩ ℔ 2.10¢
1½ to 4 in. x ⅜ to 1 in	₩ ℔ 2.10¢
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.30¢
Rods—⅜ and 11-16 round and square	₩ ℔ 2.30¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger (except 3½ in. and 4 x ¼ 2.50¢)	2.40¢
3 in. x 3 16 in. and ¼ in.	2.65¢
1½ to 2½ in. x ⅛ in.	2.45¢
1½ to 2¾ in. x 3-16 in. and thicker	2.40¢
1 to 1¼ in. x 3-16 in.	2.45¢
1 to 1¼ x ⅛ in.	2.50¢
⅞ x ⅛ in.	2.65¢
⅝ x ⅛ in.	2.75¢
⅝ x ⅛ in.	3.80¢
½ x 3-32 in.	4.30¢
Tees:	
1 in	2.75¢
1¼ in.	2.55¢
1½ to 2½ in.	2.45¢
3 in. and larger	2.50¢
Beams	2.40¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.45¢
"Burden's Best" Iron, base price	3.30¢
Burden's "H. B. & S." Iron, base price	3.10¢
"Ulster"	3.10¢
Norway Bars	3.60¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No 14	₩ ℔ 2.95	3.00¢
Nos. 18 to 21	₩ ℔ 3.05	3.10¢
No. 27	₩ ℔ 3.20	3.50¢
No. 28	₩ ℔ 3.30	3.60¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔ 11¾@14½¢
Patent Planished	₩ ℔ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ ℔, 3.35¢
Nos. 22 to 24	₩ ℔, 3.75¢
No. 27	₩ ℔, 4.20¢
No. 28	₩ ℔, 4.45¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	$6.60
IX, 14 x 20	7.85
A. Charcoal:	
IC, 14 x 20	$5.65
IX, 14 x 20	6.75

American Coke Plates—Bessemer-

IC, 14 x 20.....108 ℔	$4.65
IX, 14 x 20	5.65

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$9 00
IX, 20 x 28 with an 8 lb. coating	11.00

Seamless Brass Tubes—

List December 4, 1905. Base price 25c.

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 25¢

Copper Tubes—

List December 4, 1905. Base price 30¢

Brazed Brass and Bronze Tubes—

List June 6, 1898. 29¢ ₩ ℔

High Brass Rods—

22½¢ ₩ ℔

Roll and Sheet Brass—

List June 6, 1898. 22¢ ₩ ℔

METALS—

Tin—

Straits Pig ₩ ℔ 39½@40 ¢

Copper—

Lake Ingot	₩ ℔ 19 @19¼¢
Electrolytic	₩ ℔ 18¾@19 ¢
Casting	₩ ℔ 18 @18¼¢
Sheet Copper Hot Rolled, 16 oz	₩ ℔ 28@..¢
" " 14 "	" " 29@..¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ₩ ℔ 30¢ basis
Planished Copper, 1¢ ₩ ℔ more than Polished.

Spelter—

Western ₩ ℔ 6¾ @ 7 ¢

Zinc.

No. 9, base, casks, ₩ ℔ 8.60¢ | Open ₩ ℔ 9.10¢

Lead.

American Pig	₩ ℔ 5¾@6 ¢
Bar	₩ ℔ 6¾@7 ¢

Solder.

½ & ½, guaranteed	₩ ℔ 25 @25½¢
No. 1	₩ ℔ 22½@23 ¢
Refined	₩ ℔ 19½@20 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔ ..@18¢
Hallette	@12¢
Other Brands	@11¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	nominal.
100-℔ lots	nominal.

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy and Wire	₩ ℔ 14.50@15.00¢
Copper, Light and Bottoms	₩ ℔ 13.50@14.00¢
Brass, Heavy	₩ ℔ 9.50@10.00¢
Heavy Machine Composition	₩ ℔ 13.50@14.00¢
Clean Brass Turnings	₩ ℔ 8.35@ 8.75¢
Composition Turnings	₩ ℔ 11.00@11.50¢
Lead, Heavy	₩ ℔ ....@ 4.25¢
Tea Lead	₩ ℔ ....@ 4.00¢
Zinc Scrap	₩ ℔ ....@ 4.25¢
No. 1 Yard Wrought, Long	$13.50@14.00
No. 1 Yard Wrought, short	$13.00@13.50
Wrought Pipe	$10.00@11.00
No. 1 Machinery Cast	$14.50@15.00
Stove Plate	$12.50@13.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

ISSUED EVERY THURSDAY MORNING.

Subscription, postpaid, $5.00 a year.

TWO DOLLAR EDITION, $2.00 a year; DOLLAR EDITION, $1.00 a year, to the United States, Mexico, Hawaii, Cuba, Philippine Islands. OTHER COUNTRIES: Weekly Edition, $7.50; Semi-monthly Edition, $4.00; Monthly Edition, $2.50.

ADVERTISING RATES ON APPLICATION.

New York (Main Office),	14-16 Park Place,	DAVID WILLIAMS CO., Pub.
Philadelphia,	Real Estate Trust Co. Bldg., Broad and Chestnut Sts.,	S. S. RECKEFUS, Manager.
Pittsburgh,	Park Building, 357 Fifth Avenue,	ROBERT A. WALKER, Manager
Chicago,	Fisher Building, Dearborn and Van Buren Streets,	A. A. AINSWORTH, Manager
Cincinnati,	Pickering Building, Fifth and Main Streets,	HENRY SMITH, Manager.
Boston,	Compton Building, 161 Devonshire Street,	WALTER C. ENGLISH, Manager.
Cleveland,	The Cuyahoga, 311 Superior Street	EZRA S. ADAMS, Manager.

Remittances should be made by Draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by Post Office, Bank or Express Money Order on New York. When those cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A. The International News Company, New York, U. S. A., and London, England; or the San Francisco News Company, San Francisco, Cal., U. S. A.

ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND-CLASS MATTER.